SPECIALIST REPORT:
WATER AND SOIL
BORDERTOWN TO CALIFORNIA
120 KV TRANSMISSION LINE PROJECT

SIERRA COUNTY, CALIFORNIA
AND
WASHOE COUNTY, NEVADA

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LIST OF ACRONYMS & ABBREVIATIONS

Basin Plan	Water Quality Control Plan for the Lahontan Region
BLM	Bureau of Land Management
BMP	Best Management Practice
CFR	Code of Federal Regulations
CIAA	Cumulative Impacts Analysis Area
COM	Construction, Operation, and Maintenance
CWA	Clean Water Act of 1972
EIS	Environmental Impact Statement
FEMA	Federal Emergency Management Agency
Forest Plan	1986 Toiyabe National Forest Land and Resource Management Plan
GIS	Geographic Information System
HUC	Hydrologic Unit Code
JBR	JBR Environmental Consultants, Inc.
kV	Kilovolt
LRWQCB	Lahontan Regional Water Quality Control Board
MVUM	Motor Vehicle Use Map
NEPA	National Environmental Policy Act of 1969
NFS	National Forest System
NDEP	Nevada Division of Environmental Protection
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
OHV	Off-Highway Vehicle
PPOD	Preliminary Plan of Development
ROW	Right-of-Way
SNFPA	Sierra Nevada Forest Plan Amendment
SF	Standard Form
SPP	Spill Prevention Plan
SWPPP	Storm Water Pollution Prevention Plan
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USGS	United States Geological Survey

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1.0 INTRODUCTION

NV Energy, Inc. (NV Energy) filed a Standard Form (SF) 299 Application for Transportation and Utility System and Facilities on Federal Lands with the U.S. Department of Agriculture, Forest Service (USFS), Carson Ranger District, and the U.S. Department of the Interior, U.S. Bureau of Land Management (BLM), Eagle Lake Field Office. The application was submitted seeking authorization to construct, operate, and maintain a 120 kilovolt (kV) transmission line, which is referred to as the Bordertown to California 120 kV Transmission Line Project (proposed project).

1.1 PURPOSE OF SPECIALIST REPORT

The purpose of this specialist report is to characterize existing water and soil resources within the potentially affected area and to analyze and disclose potential effects on water and soil resources that would occur under implementation of the alternatives considered for detailed analysis, as described in **Section 1.3** of this specialist report. This report recommends project design features to reduce or avoid impacts expected from the alternatives. The data and effects analysis in this specialist report will be used to support an Environmental Impact Statement (EIS) that is being prepared by the USFS pursuant to Section 102 of the National Environmental Policy Act of 1969 (NEPA). The USFS, Carson Ranger District is the lead agency. The BLM, Eagle Lake Field Office is a cooperating agency in the preparation of the EIS, and several state and local agencies are also participating as cooperating agencies.

This Specialist Report largely focuses on the water and soil resources that occur on National Forest System (NFS) land within the potentially affected area. However, there are also BLM-administered public lands and private lands that could be potentially impacted by the proposed project, and thus the resources on these lands are also discussed.

1.2 PROPOSED PROJECT

Sections of the proposed transmission line that would cross NFS land or public land administered by the BLM would be constructed, and then operated and maintained within a right-of-way (ROW). The ROW would be a strip of land that is measured 45 feet in width on either side of the proposed transmission line alignment, making the total width 90 feet. Because the ROW

boundary would be equidistance from either side of the transmission line alignment, the alignment is effectively the longitudinal centerline of the ROW. Sections of the proposed transmission line that would cross private land would be constructed, operated, and maintained within easements. NV Energy would provide financial compensation for easements to private owners as determined by a qualified third-party appraiser, through negotiations, or through the courts. Easements would also be 90 feet wide, measured 45 feet in width on either side of the alignment.

The proposed project consists of:

- the construction, operation and maintenance of a 120 kV overhead transmission line between the existing Bordertown and California substations in Sierra County, California;
- modifications and improvements to both substations for accommodating the addition of the proposed transmission line, including expansion of the existing boundary of the Bordertown Substation facility; and,
- widening of existing roads and construction of new temporary access roads necessary for construction and maintenance of the proposed transmission line.

The proposed transmission line would consist of bundled aluminum conductor steel-reinforced cable supported on single circuit pole structures. A combination of single-pole structures, two-pole H-frame structures, and three-pole dead end/angle structures would be used for the proposed transmission line. Single-pole structures would be used less frequently because they would generally be used only where confined space prevents the use of the wider two-pole H-frame or three-pole dead end/angle structures. Single pole structures would be approximately 60 to 90 feet tall, depending on terrain and obstructions. The two-pole H-frame structures and the three-pole dead-end/angle structures would be approximately 50 to 90 feet tall, depending on terrain or obstructions. The span distance between the poles would typically average 800 feet but could range from 200 feet to 2,000 feet depending on terrain or obstructions. Weathered steel, characterized by a stable, rust-like finish that closely resembles the color of wood poles, would be used for all poles.

1.2.1 Project Construction

Construction of the proposed transmission line would consist of the establishment of staging areas, pole sites, and transmission wire setup sites; the construction of access roads, including widening existing roads; and, the installation of the pole structures and conductor and shield wires. The exact location of these project elements would be determined prior to construction. See the Preliminary Plan of Development (PPOD) (JBR Environmental Consultants, Inc., 2009) for a detailed description of power pole assembly, wire stringing, and construction equipment.

Up to four staging areas may be needed to store construction materials, equipment, tools, fuel, service trucks, spare parts, and vehicles. The staging areas would house portable, self-contained toilets and possibly portable offices or serve as equipment maintenance areas. Staging areas would measure approximately 500 feet in length by 500 feet in width. No staging areas would be located on NFS land. Any hazardous materials such as fuel, lubricants, and solvents, would be handled and stored in accordance with applicable regulations, including Title 40 Code of Federal Regulations (CFR) Part 262 (40 CFR 262). Handling, storage, and clean-up of hazardous materials at staging areas would be described in a Spill Prevention, Control and Countermeasures (SPCC) Plan, which would be included as part of the Construction, Operation, and Maintenance (COM) Plan. Staging areas would include secondary containment to capture and contain any potential spills or leaks.

Poles would be set in the ground, typically without a foundation or footing, and then backfilled with native soils removed during excavation of the hole for the pole structure and/or imported backfill material (i.e., soils). Guy wires and soil anchors would be installed on three-pole dead-end/angle structures to offset changes in wire tension due to the change in the direction of the transmission line at angle poles. Concrete foundations would be used with self-supporting angle pole structures where guy wires and soil anchors could not be installed to support three-pole dead-end/angle poles, such as when there is roadway interference. Pole sites, which are the area at each proposed power pole structure that would be required for the construction equipment, excavation of the hole for the pole, and installation of the pole structure, would not exceed approximately 0.5 acre in size for single-pole and two-pole H-frame structures. Pole sites would typically not exceed 1 acre in size for three-pole dead-end/angle structures and self-supporting angle pole structures on concrete foundations. Pole sites in steeper terrain may be graded level for safe operation of equipment. Level equipment pads would not be re-graded, but reseeded so that the pad would be available for future maintenance of the pole. Materials, including the transmission poles, insulators, guy wire anchors, and all other associated hardware, would be delivered from staging areas to each of the pole sites.

After pole structures have been assembled and installed, construction crews would perform wire stringing and installation of conductors and shield wires. Wire stringing and installation activities would be performed from transmission wire setup sites. Transmission wire setup sites would measure approximately 600 feet in radius. It is anticipated that wire installation and stringing would require between 6 and 16 transmission wire setup sites. The number of sites is a function of wire-reel span lengths and engineering requirements for conductor sagging.

Existing roads would be used for construction and maintenance access as much as possible. In order to accommodate construction equipment, roads would be widened up to 30 feet, including cut and fill slopes. Roads that would be widened include designated NFS roads and two-track roads (i.e., roads shown on the Carson District Motor Vehicle Use Map [MVUM] [USFS,

2011]). Certain roads that are wide enough to not require widening may need blading or installation of erosion control measures. Road improvements would comply with: 1) *The Forest Service National Supplements to the FP-03* (USFS, 2010); 2) the Forest Service Handbooks (FSH) for road construction (FSH 7709.56 and FSH 7709.57); and, 3) the Forest Plan. Several designated NFS roads have seasonal use restrictions from April 1 to November 18 that would be followed during construction. All designated NFS roads widened for construction or maintenance access would be restored to the original roadbed.

New access roads (i.e., centerline travel road and spur roads) would be constructed to pole sites, transmission wire setup sites, and staging areas when there are no existing roads available. Access roads would be 30 feet wide and located within a 300- to 600-foot-wide corridor (variable-width corridor). The variable-width corridor would be centered on the transmission line and would measure 300 feet wide where slopes are 10 percent or less, and 600 feet wide where slopes are greater than 10 percent. Roads would be constructed primarily by mowing or masticating vegetation in a manner that leaves root systems intact to encourage re-growth and minimize soil erosion. Whole-tree removal would be necessary where new access roads cross forested areas. Rocks or other obstructions would be bladed. If rocks cannot be removed with heavy equipment, blasting may be used. While new access roads wider than 30 feet would not be expected, occasional widening beyond 30 feet may be necessary in areas where extensive blading and side cuts are required. Erosion and sediment controls would be installed as identified in the project Storm Water Pollution Prevention Plan (SWPPP), which would be included as part of the COM Plan.

Road construction across perennial streams would be avoided. Where improvements are needed to cross ephemeral and intermittent streams, the side slopes of drainages would be reduced to a slope that would allow safe vehicle travel, and the slopes and drainage bottom would be rock armored. Once construction is complete, all drainage modifications would be re-graded to restore pre-construction contours and seeded based on existing site conditions.

After construction, temporary access roads would be re-graded (i.e., re-contoured) and stabilized by seeding and installing erosion control features such as water bars. Where deemed appropriate by the USFS, roads near sensitive resources may not be re-graded in order to avoid inadvertent disturbance to resources. Barriers would be installed on all restored access roads located on NFS land to prevent unauthorized vehicle use. If future road access is needed for maintenance of the transmission line and depending upon the level of proposed new disturbance or the change in environmental conditions, a review of the sufficiency of the existing NEPA analysis would be made.

The approximate ground disturbance for each construction activity or area is provided in **1**. Most ground disturbance would be temporary and would be restored following construction. Other disturbance would be permanent, such as the pole-structure footings at each pole site.

Table 1 Temporary Ground Disturbance Required for Project Construction

Construction Activity or Area	Approximate Construction Dimensions/Disturbance	Estimated Number
Poles structures: Single pole Two-pole H-frame Three-pole dead-end/angle	 85-foot radius (+/- 0.5 acre) 85-foot radius (+/- 0.5 acre) 120-foot radius (+/- 1.0 acre)	Span distance between pole structures would typically average 800 feet, but could range from 200 to 2,000 feet depending on terrain or obstructions
Transmission wire setup sites	Approximately 600 feet radius (+/- 26 acres)	Between 6 and 16 sites, but would vary by alternative
Staging areas	500 feet long and wide (+/- 5.7 acres)	As many as 4 construction staging areas would be necessary
Widening of existing roads	30-foot-wide disturbance (consisting of a traveled way measuring up to 14 feet wide plus any curve widening, turnouts, and side cut and fill slope areas)	Varies by alternative (see **Sections 1.3.2.1** through **1.3.2.4**)
New access roads (i.e., spur roads, centerline travel road, and cross country travel)	30-foot-wide disturbance (consisting of a traveled way measuring up to 14 feet wide plus any curve widening, turnouts, and side cut and fill slope areas)	Varies by alternative (see **Sections 1.3.2.1** through **1.3.2.4**)
Tree removal from transmission line clearance area	Clearance area includes area directly beneath transmission line and areas within 21 feet to either side of each transmission line cable. Additional trees within ROW or outside of ROW that may potentially fall onto the cables or pole structures would be removed. Construction of log landings (+/- 0.5 acre) and skidding would create additional disturbance and may occur outside the ROW.	Varies by alternative

Source: (JBR Environmental Consultants, Inc., 2009)

Prior to construction on NFS land and BLM-administered public land, noxious weeds would be inventoried and treated within the ROW and areas within 100 feet of project ground disturbance. Treatment methods would include manual and mechanical methods and the use of the following herbicides (brand/shelf name is parentheses): Aminopyralid (Milestone); Clopyralid (Transline); Chlorsulfuron (Telar); Glyphosate (Roundup and Rodeo); Imazapic (Plateau, which is not labeled for use in California); and Triclopyr (Garlon). A five-gallon backpack sprayer would be the primary method of herbicide application, but large infestations may require a truck-mounted sprayer.

During construction, vegetation would be removed as needed at pole sites, staging areas, transmission wire setup sites, and access roads. Removal of vegetation would generally consist of mowing or masticating shrub and grass vegetation in a manner that leaves root systems intact to encourage growth and minimize soil erosion. During construction in forested areas, whole trees would be removed using heavy equipment where terrain and slope stability permits and skidded to log landings for disposal. In areas with excessive slopes and highly erodible soils, trees would be removed by crews with chainsaws and removed with helicopters. Slash would be removed or chipped and broadcast onto an adjacent area to prevent fuel loading. Prior to cutting trees on private land in California, a *Public Agency, Public and Private Utility Right of Way Exemption* would be obtained from the California Department of Forestry and Fire Protection. The exemption would waive the requirement to prepare and file a Timber Harvesting Plan.

The project must confirm with National safety and reliability standards and rules and California and Nevada regulations. The most restrictive of these standards, rules, and regulations require that obstructions be no closer than 21 feet to overhead 120 kV transmission lines. A transmission line can be expected to sag during heavy electrical loading and warm weather to within 22 feet of minimum line clearance of the ground at mid-span. To achieve the required clearance, all trees beneath the proposed transmission line and 21 feet of either side of the conductor cables would initially be removed during construction. Beyond 21 feet, any tree with the potential to fall onto the conductors or pole structures would also be removed, regardless of whether the tree is located within the proposed ROW/easement. Removal of trees from within 21 of the conductors, as well as trees with potential to onto the conductors or pole structures would routinely continue as needed through maintenance of the project. Tree removal during maintenance of the proposed transmission line would be performed using chain saws or a masticator. Maintenance access would be by foot-travel, pickup truck, bucket truck, or off-highway vehicle (OHV) from the nearest designated NFS or maintenance road.

Construction of the proposed project is estimated to require 8 to 12 months to complete, depending on weather or other unforeseeable events. Near sensitive receptors (i.e., occupied residences), noise-generating activities (e.g., blasting) would be limited to Monday through Friday from 7:00 a.m. to 7:00 p.m. Otherwise, work may occur 12 hours per day any day of the week. The size of the construction workforce would vary depending upon the active construction phase, but it is anticipated that it would generally include 50 to 100 people. Typical equipment and vehicles necessary for construction of the proposed project would range from standard-sized pickup trucks, to large cranes and bulldozers. Depending on site specific conditions encountered during construction, a helicopter may also be required. All construction equipment, surplus construction materials, and construction debris and wastes would be removed upon completion of the proposed construction activities and any maintenance activities.

1.2.2 Project Restoration

The terms “reclamation” and “restoration” are used interchangeably throughout this report, as are the terms “reclaim” and “restore”. A detailed plan for restoration of all construction-related ground disturbance would be included as part of the COM Plan. Restoration will include disturbances created during tree clearing, including skid trails and landings. The restoration plan would include re-vegetation success criteria based on USFS vegetation matrices and reference sites. Restoration success on NFS land would be monitored until it is deemed successful by the USFS.

Establishment and restoration of vegetation cover would be accomplished by seeding. Seed mixes and seeding rates would be tailored to the vegetation community, soil substrate, elevation, and land administration/ownership. However, all seed mixes would be certified as weed-free and approved by the appropriate land management/regulatory agencies. Prior to seeding, any topsoil salvaged during construction would be replaced and sufficiently stabilized. Loosening of compacted soils that may have resulted from construction activities would also be performed prior to seeding. Chips may also be incorporated into the soil, where allowed. Restoration success would be monitored afterwards. The success criteria would be based on reference sites selected by the USFS and establish the target species and minimum amount of cover that would be required on restored areas within 5 growing seasons.

1.2.3 Operation and Maintenance

The transmission line would be operated from the NV Energy Electrical Control Center in Reno, Nevada. Personnel at the Electrical Control Center would monitor voltage and power flow along the transmission line in accordance with standard operating procedures.

NV Energy would inspect the line annually to determine if maintenance is needed. Annual inspections would be from helicopter or from the ground by walking to pole structures from existing roads. An inspection that involves climbing pole structures is anticipated once every 10 years. Access to the transmission line would be from existing roads using pickup trucks, an all-terrain OHV or by walking to the pole structure. The ROW would be patrolled after unexplained outages or significant natural incidents (such as fires, earthquakes, floods, torrential rains, avalanches, or extreme electrical storms) to observe facility conditions and the surrounding environment and to begin repairing any damages. Trees that could interfere with the safe operation of the transmission line would be removed as needed (see **Section 1.2.1**).

1.2.4 Design Features Common to All Alternatives

The project includes design features that are specific measures developed for the project to avoid environmental impacts. Design features that protect water and soil resources are listed below.

General Practices (GP)

GP 1. All environmentally sensitive areas (i.e., culturally sensitive areas, meadows, and special status plant populations) will be temporarily fenced during construction for avoidance.

GP 2. Prior to construction, all construction personnel will be instructed on the protection of sensitive biological and cultural resources that have the potential to occur on-site by qualified personnel.

GP 3. Construction activities may require temporary access through existing fences and gates on public and private land. Fencing will be replaced when construction activities are completed. Replacement fencing will be built to agency or landowner specifications, consistent with the fencing that was removed. During construction, fences with open gates will remain open and fences with closed gates will remain closed. Fences crossed during construction will be braced and secured prior to cutting the fence to prevent slackening of the wire.

GP 4. If blasting is required within proximity to the Kinder Morgan buried gas pipeline located next to Dog Valley/Henness Pass Road between Verdi and "Summit One", NV Energy will coordinate with Kinder Morgan and use a qualified licensed blaster.

GP 5. Concrete wash out stations will be pre-approved and the water will be captured and disposed of.

Vegetation (VG)

VG 4. Trees identified for removal will be whole tree yarded to log landings for disposal. All logs and slash will be removed from NFS land. Woodchips not needed for restoration will also be removed from NFS land.

VG 5. Where removal of vegetation other than trees is unavoidable, the vegetation will be cut at ground level to preserve the root structure and allow for potential sprouting.

VG 6. All areas of temporary ground disturbance that result from the construction or maintenance of the project will be restored as required by the land management agency and per any applicable permits. Restoration will include restoring contours to their approximate pre-construction condition, stabilizing the area, installing erosion control features (such as cross drains and water bars), and seeding and re-vegetating. Revegetation may include incorporation of chips into the soil as needed, installing erosion control features such as installing cross drains and placing water bars in the road.

VG 7. Successfully restored areas will be defined as:

Reference sites will be pre-established and approved by the USFS. Reference sites will include plant communities that are representative of the ecological site as described by NFS Matrices. Reference sites must include plant communities that are in a late-seral and ecologically functioning condition.

VG 8. Project implementation will comply with conditions in Lahontan Water Quality Control Board timber harvest waiver.

Water Resources (WA)

WA 1. A SWPPP will be prepared to minimize erosion from the project construction worksites and to contain sediment. The SWPPP will be prepared in accordance with the National Pollutant Discharge Elimination System (NPDES) General Construction Stormwater Permit. At a minimum, it will identify the existing drainage patterns of the construction work sites and ROW/easement, nearby drainages and washes, potential pollutant sources other than sediment, and erosion and sediment control measures and best management practices (BMPs) that will be implemented to protect stormwater runoff. The SWPPP will include maps with locations for erosion and sediment control measures, and BMPs. The SWPPP will be kept on site throughout the duration of construction.

WA 2. Adequate erosion and stormwater controls will be installed prior to and during surface-disturbing activities, including access roads and staging areas. Erosion and stormwater controls will be maintained as necessary to ensure proper and effective functioning condition.

WA 3. Erosion and stormwater controls will be inspected on the ground at least once every seven days and within 24 hours of a storm event of 0.5 inch or greater. Weather forecasts and data available from the National Weather Service in Reno will be used to determine total precipitation associated with a storm event. Qualified personnel of NV Energy or its contractors with specific training in erosion and sediment control will perform the inspections.

WA 4. Construction equipment staging areas, and storage of equipment fuels will not be located within 300 feet of perennial streams or within 150 feet of seasonally flowing streams (i.e., intermittent and ephemeral streams). Staging areas and fuel storage will also not be located within 150 feet of any other water features, such as wetlands.

WA 5. Pole sites and staging areas will not be constructed within the 100-year floodplain of any stream or within wetlands.

WA 6. Construction equipment will not be operated on unstable soils or on soils too wet to adequately support equipment in order to prevent rutting, puddles on soil surface, or runoff of sediments directly into water bodies.

WA 7. Water drafting (i.e. water withdrawal) from streams will not be permitted. Water shall be provided by truck for dust abatement and other project needs.

Temporary Stream Crossings

WA 8. Improvements to any existing road crossing will be designed to minimize surface disturbance.

WA 9. Crossings will be located where the stream channel is narrow, straight, and uniform, and has stable soils and relatively flat terrain. Stream crossings will be oriented perpendicular to the stream channel. All stream crossings will be designed and installed such that sufficient load-bearing strength for the expected equipment is provided.

WA 10. Stream crossings will be designed for a normal range of flows for the site, and crossings that must remain in place during high runoff seasons will be stabilized. However, all crossings will be temporary and will be removed at the end of the construction season. The water body profile and substrate will be restored when the crossing is removed.

WA 11. Stream crossings will be regularly monitored while installed to evaluate the condition. Any repairs or improvements to the crossings identified during monitoring will be promptly addressed.

WA 12. Surface drainage and roadway stabilization measures will be used to disconnect the access road from the stream in order to avoid or minimize water and sediment from being channeled into surface waters and to dissipate concentrated flows.

WA 13. On perennial streams, existing crossings will be utilized and no new crossings will be constructed.

Plants and Sensitive Plant Communities (SV)

SV 3. There will be no new access roads or widening of existing roads for construction access through meadows. This measure would also protect potential habitat for special status plant populations that are found in wetland and meadow habitats, such as Dog Valley ivesia.

SV 4. Poles, staging areas, and line clearance areas, and any project-related ground disturbance will avoid all special status plant populations.

Wildlife and Sensitive Species (WL)

WL 9. To limit the potential for impacts to aquatic resources, particularly to Lahontan cutthroat trout, NV Energy will not place pole sites or roads within the 100-year floodplain in drainages occupied by Lahontan cutthroat trout, specifically Dog Creek and the Truckee River. During construction, no soil disturbing activities will occur within the 100-year floodplain of either drainage.

Recreation/Roads/Transportation (RT)

RT 2. All new temporary access roads and all improvements to existing roads will comply with: 1) The Forest Service National Supplements to the FP-03 (USFS, 2010); 2) the USFS Road Construction Handbooks (FSH 7709.56 and FSH 7709.57); and, 3) the Forest Plan.

RT 3. All new access roads (i.e., spur roads and centerline travel roads) specifically constructed for this project, including those determined to be necessary for maintenance of the transmission line, will have a physical closure installed to prevent motorized access immediately following the completion of construction and restoration. The types of closure and design specification used will be approved by the USFS prior to installation.

RT 5. Maintenance activities which cause a road to be opened to unauthorized vehicles or damage to restoration improvements will need to be assessed and barriers reinstalled as needed at the expense of NV Energy.

RT 6. Restored roads will require a signage and monitoring plan implemented by NV Energy for compliance with the closure which will include inspecting the barricade areas to determine the effectiveness of the blockades at preventing unauthorized motorized vehicle use of the restored access roads. Signs will notify the public that construction access roads are closed and are being restored. Signs will be replaced by NV Energy if vandalism occurs to the signs.

RT 7. If unauthorized vehicle use occurs on restored roads, barricades and reclamation would be monitored for effectiveness and remedial measures taken. Monitoring will continue until disturbed areas are successfully restored.

RT 9. All construction vehicle movement will be restricted to the transmission line ROW/easement, pre-designated access roads, public roads, and private roads. All existing roads will be left in a condition equal to or better than their preconstruction condition.

1.3 PROPOSED ACTION AND ALTERNATIVES

The Stateline Alternative was presented as the Proposed Action in the Notice of Intent (NOI) to Prepare an EIS in the Federal Register and to the public during scoping meetings. This alternative is no longer feasible and is now an alternative that was eliminated from detailed study for the reasons discussed in Chapter 2 of the pending DEIS.

With the elimination of the Stateline Alternative, the alternatives selected for analysis in the DEIS and in this specialist report include:

- No Action Alternative
- Mitchell Alternative
- Peavine Alternative
- Poeville Alternative
- Peavine/Poeville Alternative

Each of these alternatives is described below.

1.3.1 No Action Alternative

Under the No Action Alternative, the USFS would not issue a Special Use Permit (SUP) for a transmission line ROW across NFS land, and the BLM would not issue an amended ROW Grant for a transmission line or substation expansion on BLM-administered public land. Thus, the construction, operation, and maintenance of the proposed transmission line across NFS land and BLM-administered public land, as well as private land would not occur. The existing 120 kV system would continue to rely on the #141 and #142 transmission lines for transmitting electric load to the West Reno/Verdi area in the foreseeable future. The No Action Alternative does not provide the redundancy needed in the system and therefore would not meet the purpose and need for the project.

1.3.2 Action Alternatives

The four action alternatives analyzed within this specialist report consist of the Mitchell, Peavine, Poeville, and Peavine/Poeville Alternatives. Under implementation of any of the action alternatives, the USFS would issue a SUP for a transmission line ROW, and the BLM would issue an amended ROW Grant. For temporary roads and construction access located outside of the transmission line ROW, the USFS would issue a temporary SUP. NV Energy would purchase easements from private landowners for construction and operation of the line across private property. The ROW and easements for the proposed transmission line would be 90 feet wide for all action alternatives. The total acres of ROW and easements would vary among each of the

action alternatives. **Table 2** provides a summary of the total miles of proposed transmission line and total acres of ROW/easement area that would occur on NFS land, BLM-administered public land, and private land for each action alternative.

Table 2 Summary of Action Alternatives

Action Alternative	Length of Alignment Alternative (Miles)				Area of ROW/Easement Required (Acres)			
	USFS	BLM	Private	Total	USFS	BLM *	Private	Total
Mitchell Alternative	8.4	0.4	2.9	**11.7**	91.6	8.1	31.6	**131.3**
Peavine Alternative	7.0	0.4	2.9	**10.3**	76.4	8.1	31.6	**116.1**
Poeville Alternative	3.8	0.4	13.8	**18.0**	44.7	8.1	147.3	**200.1**
Peavine/Poeville Alternative	4.3	0.4	7.1	**11.8**	46.9	8.1	78.5	**133.5**

*Includes proposed expansion area associated with the Bordertown Substation.

Implementation of any of the action alternatives would result in the construction, operation, and maintenance of the proposed project as described in **Section 1.2**. The same construction methods and procedures and design features would be used. The location of construction staging areas and wire set-up sites are placed specific to the unique conditions and configuration of a particular alignment. Construction staging areas would not be located on NFS land under any action alternative, but transmission wire setup sites may be located on NFS land. The presence and condition of existing roads available for construction access is also unique and specific to the action alternatives. Consequently, the total length of existing roads that would require improvements to use for construction access would vary among the action alternatives. The total length of new temporary access roads required for construction of the project would also vary among the action alternatives.

1.3.2.1 Mitchell Alternative

The Mitchell Alternative would be approximately 11.7 miles long. The first approximately 5.0 miles would be identical to the first approximately 5.0 miles of the Peavine Alternative and generally parallel with the California and Nevada State line, staying approximately 0.6 to 0.9 mile east of the state line. The last approximately 0.8 mile of the alignment would also be identical to the Peavine Alternative. The last approximately 0.4 mile of transmission line into the California Substation would utilize single pole structures with a distribution line under-build to accommodate the new transmission line and existing distribution line on the same poles. Approximately 4.6 miles of the Mitchell Alternative would be located adjacent to an existing power line corridor (**Figure 1**).

Approximately 11.1 miles of roads would be widened for construction access. **Table 3** presents the miles of road required to be widening and the surface disturbance associated with the widening.

Table 3 Road Widening Required for the Mitchell Alternative

Road/Route Type	Widening Required (Miles)	Surface Disturbance (Acres)[1]
Designated NFS Roads on NFS Land	5.6	14.4
Non-Designated Routes on NFS Land	1.1	2.7
Existing Roads Across Private Land	4.4	11.2
Total (Roads/Routes on All Land):	11.1	28.3

[1] Does not include existing road disturbance, which is assumed to be 9 feet wide.

The location of temporary new access roads would be determined prior to construction, but would be located within a 300- to 600-foot-wide variable-width corridor. Approximately 7.1 miles of new temporary centerline travel roads would be needed for construction of the Mitchell Alternative, resulting in approximately 25.8 acres of surface disturbance.

Design Features Specific to the Mitchell Alternative Relevant to Watershed Resources

Water Resources

WA 14. In order to minimize impacts to Dog Creek, existing crossings will be improved and no new road crossings will be constructed.

1.3.2.2 Peavine Alternative

The Peavine Alternative would be approximately 10.3 miles long (**Figure 1**). The first approximately 5.0 miles and the last approximately 0.8 mile of the Peavine Alternative would be identical to the Mitchell Alternative. The Peavine Alternative generally parallels the California State line, staying on the Nevada side by approximately 0.6 to 0.9 mile. The last approximately 0.4 mile of the transmission line would be constructed within an existing utility corridor on single pole structures as part of an under-build with an existing distribution line. Approximately 2.8 miles of the Peavine Alternative would be located adjacent to an existing power line corridor.

Approximately 20.8 miles of existing roads would be widened for construction access. **Table 4** presents the miles of road required to be widening and the surface disturbance associated with the widening.

Table 4 Road Widening Required for the Peavine Alternative

Road/Route Type	Widening Required (Miles)	Surface Disturbance (Acres)[1]
Designated NFS Roads on NFS Land	10.0	25.5
Non-Designated Routes on NFS Land	1.4	3.5
Existing Roads Across Private Land	9.5	24.3
Total (Roads/Routes on All Land):	20.8	53.3

[1] Does not include existing road disturbance, which is assumed to be 9 feet wide.

Approximately 7.5 miles of new temporary centerline travel roads would be needed for construction of the Peavine Alternative, resulting in 27.3 acres of surface disturbance.

1.3.2.3 Poeville Alternative

The Poeville Alternative would be approximately 18.0 miles long (**Figure 1**). Beginning at the Bordertown Substation, this alternative would parallel the Alturas 345 kV transmission line for approximately 6.7 miles and then follow the existing distribution power line toward the top of Peavine Peak. Construction of this section would consist of single pole structures with an under-build of the distribution line. East of Verdi, the Poeville Alternative would replace the existing, but currently inactive 60 kV #632 distribution line in its exact location, parallel with the existing #114 and #106 lines through Verdi to the California Substation. The existing #632 line H-frame pole structures would be replaced with new H-frame pole structures. Approximately 12.6 miles of the Poeville Alternative would be located adjacent to an existing power line corridor.

Approximately 24.2 miles of existing roads would be widened for construction access. **Table 5** presents the miles of road required to be widening and the surface disturbance associated with the widening.

Table 5 Road Widening Required for the Poeville Alternative

Road/Route Type	Widening Required (Miles)	Surface Disturbance (Acres)[1]
Designated NFS Roads on NFS Land	1.8	4.5
Non-Designated Routes on NFS Land	0.9	2.4
Existing Roads Across Private Land	21.5	55.1
Total (Roads/Routes on All Land):	24.2	62.0

[1] Does not include existing road disturbance, which is assumed to be 9 feet wide.

Approximately 5.4 miles of new temporary centerline travel roads would be needed for construction of the Poeville Alternative, resulting in approximately 19.6 acres of surface disturbance.

1.3.2.4 Peavine/Poeville Alternative

The Peavine/Poeville Alternative would be approximately 11.9 miles long (**Figure 1**). The first approximately 6.4 miles of the Peavine/Poeville Alternative would be the same as the first 6.4 miles of the Peavine Alternative. The last approximately 3.8 miles would be the same as the last 3.8 miles of the Poeville Alternative. A total of approximately 4.1 miles of the Peavine/Poeville Alternative would be located next to an existing power line corridor.

Approximately 26.1 miles of existing roads would be widened for construction access. **Table 6** presents the miles of road required to be widening and the surface disturbance associated with the widening.

Table 6 Road Widening Required for the Peavine/Poeville Alternative

Road/Route Type	Widening Required (Miles)	Surface Disturbance (Acres)[1]
Designated NFS Roads on NFS Land	8.9	22.6
Non-Designated Routes on NFS Land	0.0	0.0
Existing Roads Across Private Land	17.2	43.7
Total (Roads/Routes on All Land):	26.1	66.3

[1] Does not include existing road disturbance, which is assumed to be 9 feet wide.

Approximately 7.8 miles of new temporary centerline travel roads would be needed for construction of the Peavine/Poeville Alternative, resulting in approximately 28.4 acres of surface disturbance.

1.3.3 Stateline Alternative - Proposed Action (Dismissed from Detailed Analysis)

The Stateline Alternative was presented as the Proposed Action in the NOI and to the public and cooperating agencies. As proposed, it would be approximately 10 miles long. From the existing Bordertown Substation the line would coincide with the existing Alturas 345 kV transmission line corridor, crossing the state line into Washoe County. The line would then depart from the Alturas 345 kV corridor, turn generally south and roughly paralleling the California State line, staying on the Nevada side, approximately 0.1 mile east of the California State line. After crossing upper Mitchell Canyon, but before crossing Dog Creek, the line would turn southwest and cross the state line back into California. The line would continue southwest until reaching the existing #102 power line corridor. The line would follow this corridor towards Dog Valley/Henness Pass Road. From there, it would follow Dog Valley/Henness Pass Road across private land to the California Substation.

During scoping, it was determined that sections of the proposed transmission line would cross occupied habitat for Webber ivesia (*Ivesia webberi*). Webber ivesia was recently added the federal list of threatened and endangered species. In order to protect the Webber ivesia, the USFS formulated the following design feature in coordination with the U.S. Fish and Wildlife Service:

> Project activities would be excluded from the occupied habitat unit for Webber ivesia which includes the 500 meter buffer. (*Occupied habitat* includes the low sage habitat where the plants are present and a 500 meter buffer from the edge of the occurrence. The 500 meter buffer would include low sage and adjacent shrub

steppe habitats to accommodate pollinators associated with the rare plant community).

Without the inclusion of the design feature, the Stateline Alternative would not be environmentally reasonable due to potential impacts to the occupied habitat unit for Webber ivesia. However, with inclusion of the design feature, the alternative would not be technically practical or feasible because the protection buffer exceeds the maximum span length possible between two pole structures. The Stateline Alternative was dismissed from further consideration and analysis because it would either be environmentally unreasonable or technically infeasible to implement.

1.4 RESOURCE ISSUES STATEMENT

1.4.1 Soils, Erosion, and Reclamation Issue

Project construction, operation, and maintenance activities may impact soils in the project area and increase erosion and sedimentation.

Implementation of the Proposed Action or alternatives could permanently affect soils by construction of new access roads; improvement of existing roads; and construction of erosion control features, pole structures, and substation expansion. Soil disturbances may cause erosion and siltation. Temporary disturbance may occur at staging areas and wire pulling sites.

1.4.2 Water Resources Issue

Construction, operation, and maintenance of the project may impact surface water and groundwater quality throughout the project area and surrounding areas.

Road construction access to construct and maintain the transmission line may require temporary disturbance of surface water features, including perennial, intermittent, and ephemeral streams and wetlands, and at road crossings. Surface disturbance from temporary road construction and construction of the transmission line may increase soil erosion and sedimentation. Equipment-operating fluids and fuels present during construction could potentially contaminate surface water if spilled or released.

1.5 REGULATORY FRAMEWORK

1.5.1 Humboldt-Toiyabe National Forest

Portions of the project area are located within the Humboldt-Toiyabe National Forest and are managed by the Carson Ranger District in accordance with all applicable federal laws and regulations, including the National Forest Management Act of 1976 and the Forest and

Rangeland Renewable Resources Planning Act of 1974. Management is further governed by the 1986 *Toiyabe National Forest Land and Resource Management Plan* (Forest Plan) (USFS 1986).

The Forest Plan provides standards and guidelines for each resource on a Forest-wide basis. The Forest Plan also defines 12 distinct management areas into which the Forest is divided and provides specific resource standards and guidelines for each management area. The project area is located within the Dog Valley Management Area and on NFS land that were acquired after the Dog Valley Management Area and Forest Plan were established. These acquisitions are located east of the Dog Valley Management Area, within the area that was identified as the Peavine Geographic Area during the 2006 revision of the Forest Plan.

According to the Forest Plan, soil, water, and riparian areas are of primary management concern, focusing particularly on sedimentation as a result of erosion factors. Specific management directives for soil, water, and riparian areas and timber resources as stated in the Forest Plan that apply to the Bordertown to California 120 kV Transmission Line Project include the following:

- If channel work is needed, every reasonable effort shall be made to preserve the natural aquatic environment or minimize adverse effects.
- Construction and other activities affecting stream channels shall be limited to periods when activities will have the least detrimental effect on aquatic environment.
- Streamside vegetation shall be maintained if feasible, or if destroyed, will be replaced to provide for the necessary needs of aquatic environment.
- Construction equipment service areas shall be located and treated to prevent gas, oil, or other contaminants from washing or leaching into streams.
- In road construction, maintenance, and other earth-moving activities, the toe of overcast materials shall be placed above the mean water line. If the best alternative is to encroach on the stream, construction methods and/or structural barriers shall be used to prevent fill material from entering the stream channel.
- All temporary roads shall be constructed to grades not exceeding safe limits for surface water control and contain sufficient water bars or other structures to prevent eroded materials from reaching streams.
- On sidehills and near channel crossings, road drainages shall discharge where sediment can settle out before runoff reaches a stream channel, unless this is clearly unfeasible.
- Transport of sediment from disturbed areas shall be minimized by flocculation, ponding, vegetative barrier strips, or other means.

- Roadway sections parallel and contiguous to stream channels shall be designed, constructed, and maintained to minimize concentrated surface runoff from the roadbed and slopes.
- Construction shall be avoided during wet season or other undesirable runoff periods to minimize sedimentation directly into streams.
- Wheeled, track-mounted, or other heavy equipment shall not be operated in stream courses except when approved by the land manager at designated crossings or, if essential to construction activities, as specifically authorized by the land manager.
- Revegetation of lands impacted by channel changes shall be done with available native plants and appropriate non-native plants.
- Bridges, culverts, water level recording, and stream channel protection facilities, including riprap, shall be designed and constructed to harmonize with the natural environment.
- Upon completion of a project or activity, all temporary roads shall be "erosion-proofed" by cross ditches, ripping, seeding, or other suitable means.
- Riprap or other erosion protection measures shall be of sufficient size and placed in such a manner as to withstand peak flows comparable to a 25-year flood, except where associated with major bridges which are designed for passage of a 100-year flood.
- Riprap and other erosion protection material shall be placed in such a manner as to prevent any downstream erosion.
- Allow no skidding through live streams. Skid over log bridges or use other types of structures to protect stream crossings.

Additional protection of watershed resources resulted from the amendment of the Toiyabe Forest Plan by the Sierra Nevada Forest Plan Amendment (SNFPA) (USFS 2004). The SNFPA amended the Forest Plans of a number of national forests in the Sierra Nevada and Modoc Plateau to:

- Sustain old forest ecosystems and associated species.
- Protect and restore aquatic, riparian, and meadow ecosystems and associated species.
- Improve fire and fuels management.
- Combat noxious weeds.
- Sustain lower westside hardwood forest ecosystems.

To protect watershed resources, specific standards for road construction in aquatic, riparian, and meadow areas are stated in the SNFPA. Standards that apply to the proposed project include the following:

- Design new stream crossings and replacement stream crossings for at least the 100-year flood, including bedload and debris.
- Design stream crossings to minimize the diversion of streamflow out of the channel and down the road in the event of a crossing failure.
- Design stream crossings to minimize disruption of natural hydrologic flow paths, including minimizing diversion of streamflow and interception of surface and subsurface water.
- Avoid wetlands or minimize effects to natural flow patterns in wetlands.
- Avoid road construction in meadows.
- Ensure that culverts or other stream crossings do not create barriers to upstream or downstream passage for aquatic-dependent species.

1.5.2 Bureau of Land Management Eagle Lake Field Office

The Bordertown Substation is located on public land administered by the BLM Eagle Lake Field Office. According to the *Proposed Resource Management Plan and Final Environmental Impact Statement* (BLM 2007), the following goals and objectives are provided for watershed resources:

Soil Resources

Goal: The long-term health and productivity of soil within the ELFO area would be assured, with no net loss of soil fertility. Sedimentation would be controlled, occurring at a rate that does not threaten sensitive resources, or human health and property. Lithic and earthen materials would be available for suitable uses (e.g., roads, gravel, and livestock watering facilities).

Objectives

- Continue to protect soil where land health standards are being achieved, through implementation of best management practices.
- Improve site stability and/or soil productivity where soil does not currently meet these standards.
- Prevent or eliminate erosion and sedimentation in sensitive aquatic (or other sensitive) environments to ensure there is no threat to property or human health.

- Limit development (e.g., roads, trails, facilities) to suitable soils.

- Provide sufficient earthen materials to meet the needs of county and state road departments.

Water Quality and Hydrologic Function

Goal: Ensure that the natural hydrologic function of uplands, springs, riparian areas, streams, and wetlands is achieved (or preserved) so that requirements of beneficial uses and state water quality standards are met.

Objectives

- On a priority basis, take action to improve hydrologic function and/or water quality in areas not meeting state standards—especially where hydrologic function and/or water quality problems are major factors inhibiting the success of other resource programs. Ensure that hydrologic function and water quality are preserved in areas where standards have already been achieved.

- Actions will be guided by the following objectives from the "Standards for Rangeland Health and Guidelines for Livestock Grazing Management on BLM-Administered Lands in Northeastern California and Northwestern Nevada" (Standards and Guildelines). This policy requires BLM managers to: "Maintain the physical, biological, and chemical integrity of waters flowing across or underlying the lands it [BLM] administers."

Riparian and Wetland Associations

Goal: Maintain, restore, or improve riparian vegetation, habitat diversity, and hydrologic stability to achieve healthy, productive riparian areas and wetlands. Manage for public land values such as water, cover, structure, and forage, which are needed to meet the life history requirements of fish and wildlife, public recreation and aesthetics, water quality and quantity, and livestock forage and water.

Objectives:

- Move toward PFC on most sites. The main objective is to have all riparian areas in or making significant progress toward PFC and meeting land health standards throughout the field office area. The goal of PFC is not the ultimate end point of riparian management but a step toward a fully functioning system with a desired plant community that provides watershed values, wildlife habitat, and the water and forage needs of animals.

- The desired future condition would be determined at the implementation or activity plan level, which includes AMPs and other planning documents.

1.5.3 United States Army Corps of Engineers

Construction within certain streams and wetlands would require regulatory oversight by the United States Army Corps of Engineers (USACE). The Federal Water Pollution Control Act, also known as the Clean Water Act of 1972 (CWA) is the primary federal law that governs and authorizes surface water quality control activities and is intended "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Section 404 of the CWA gives the USACE authority to regulate construction activities which are considered a "discharge of dredged or fill material" when the activity occurs in a water of the United States. The definition of water of the United States is presented in **Appendix A** and includes certain types of streams and wetlands. Fill is defined as any material used to convert an aquatic area to dry land or to change the bottom elevation of a water body.

In order to qualify for a permit, the construction (fill activity) must be the least environmentally damaging practicable alternative, so long as the alternative does not have other significant adverse environmental consequences (40 CFR 230.10(a)). The activity also needs to include water quality projection measures, because under Section 401 of the CWA, the state water quality agency (e.g. Lahontan Regional Water Quality Control Board (LRWQCB) or Nevada Division of Environmental Protection's (NDEP) Bureau of Water Quality Planning certify that the permitted activity meets state and federal water quality standards. The USACE permit would not be valid until the Section 401 certification is issued.

1.5.4 Lahontan Water Quality Regional Control Board

Construction activities on both public and private lands in California are subject to regulation by the LWQRCB. The Porter-Cologne Water Quality Control Act (California Water Code §13000 et seq.) provides the overall regulation under California law of water quality involving all waters of the State. The act overlaps the CWA in goals and objectives, but broadens the State's authority to regulate surface and groundwater. In California, waters of the State include all surface waters and wetlands, regardless of their federal status. Through the Porter-Cologne Water Quality Control Act, the LRWQCB prepared a regional *Water Quality Control Plan for the Lahontan Region* (Basin Plan) that established water quality objectives and implementation programs to protect the beneficial uses. According to the Basin Plan, water quality problems in the Lahontan Region are largely related to nonpoint sources (including erosion from construction, timber harvesting, and livestock grazing), stormwater, acid drainage from inactive mines, and individual wastewater disposal systems.

In accordance with the Basin Plan, removal of trees and construction within the 100-year floodplain of any stream would require authorization from the LRWCB. In addition to CWA 401 Water Quality Certification, other permits needed for this project are Timber Waiver (Board Order No R6T-2009-0029) and Truckee River Floodplain Prohibition Exemption. The project could qualify for an exemption if the LRWQCB concurs that the project is "necessary to protect public health or safety or to provide essential public services."

1.5.5 Nevada Division of Environmental Protection

Similar to California, construction activities on public and private lands in Nevada are subject to regulation by NDEP in order to protect the quality of waters of the State. In Nevada, waters of the State are defined by the State of Nevada in NRS 445A.415 and include all surface waters and wetlands, regardless of their federal status. NDEP administers the NPDES program, which requires an NPDES permit for construction activities. The NPDES permit will contain limits on what can be discharged, monitoring and reporting requirements, and other provisions to ensure that the activity does not impact water quality or people's health. In addition to the 401 Water Quality Certification, construction of the project would need two types of NPDES permits: Temporary Working in Waterways and Stormwater Permit for Construction Activity. Both permits require the implementation of water quality projection measures.

2.0 EXISTING CONDITIONS

Data and information used to describe the affected environment include the Forest Plan (USFS 1986), Humboldt-Toiyabe National Forest Geographic Information Systems (GIS) Corporate Data, BLM *Eagle Lake Field Office Proposed Resource Management Plan (RMP) and Final EIS* (BLM 2007), Natural Resource Conservation Service (NRCS) Web Soil Survey (NRCS 2012), United States Geological Survey (USGS) National Hydrography Dataset and hydrologic unit mapping, Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FEMA 2012), NDEP Section 303(d) listing (NDEP 2012), and field data collected by JBR Environmental Consultants, Inc. (JBR).

2.1 ANALYSIS AREA

Four analysis areas were developed in order to capture effects to soils and water resources from all project elements and quantify the magnitude of effects.

Proposed ROW

The 90 foot-wide ROW would contain the following elements:

- All permanent disturbance associated with pole structures;
- All tree removal areas needed for wire clearance safety;
- Skid trails and log landings associated with tree removal;
- Transmission wire set up and stringing sites that overlap the ROW;
- Temporary access roads (i.e., spur roads and centerline travel roads) that overlap the ROW;
- California Substation (no expansion is proposed);
- A portion of the Bordertown Substation expansion; and
- Widening of existing roads needed for access that overlap the ROW.

300-600 foot-wide variable width corridor

The variable width corridor contains the ROW and extends 105 feet to 255 feet beyond the edge of the ROW. The location of temporary construction access roads (i.e., spur roads and centerline travel roads) is unknown and cannot be determined until an alternative is selected through the NEPA process and a final design is engineered. However, all temporary construction access roads would be contained within the variable width corridor. The corridor is 300 feet-wide on slopes that are less than 10 percent, and widens to 600 feet-wide on slopes greater than 10 percent. On NFS land the corridor is generally 600 feet wide

because of the prevalence of steeper slopes. The wider corridor on steeper terrain accounts for larger construction disturbance that is necessary when slopes are steep.

The 300-600 foot wide variable width corridor includes the following project elements:

- Bordertown Substation expansion;
- Transmission wire set up and stringing sites;
- Skid trails and log landings associated with tree removal;
- Temporary access roads (i.e., spur roads and centerline travel roads) ; and
- Widening of existing roads needed for access that overlap the 300-600 foot corridor.

30 foot-wide corridor along existing roads proposed for widening

In order to create a 14 foot-wide traveled way for construction vehicles, the footprint of road widening disturbance would be a maximum of 30 feet. The maximum area of disturbance takes into account any curve widening, turnouts, and cut and fill slopes. On NFS land, existing motorized roads and trails would be widened, however, a few undesignated roads would be used.

2-mile cumulative impacts analysis area

The cumulative impacts analysis area (CIAA) is the area within two miles (2-mile buffer) from the centerline of each Action Alternative, including the California and Bordertown substations.

This specialist report uses the term "analysis area" to mean the four analysis areas described above. Where specificity is needed, the specific area (e.g., ROW, variable width corridor, road widening corridor, and CIAA) would be named.

2.2 WATERSHED

Streams in the southern portion of the analysis area flow to the south and east and are a part of the Truckee River watershed (**Figure 2**). Sub-watersheds in the southern portion of the analysis area include the Dog Creek, Bull Ranch Creek, or Hunter Creek units (**Figure 3**). Streams in the northern portion of the study analysis area flow to the north and are a part of the Eagle-Honey Lakes watershed (**Figure 2**). Subwatershed in this portion of the analysis area include Headwaters Long Valley Creek, Cold Springs Valley, and Lemmon Valley units (**Figure 3**). The Long Valley Creek sub-watershed drains to Honey Lake, while the Cold Springs Valley and Lemmon Valley sub-watersheds are internally drained and have no outlet. The sub-watersheds and the alternatives that are found within them are presented in **Table 7**.

Table 7 Sub-watersheds Overlapping the Analysis Area

Sub-watershed and Level 6 HUC Code	Watershed	Alternative
Dog Creek 60501020503	Truckee	Mitchell Peavine
Bull Ranch Creek-Truckee River 160501020504	Truckee	Mitchell Peavine Poeville Peavine/Poeville
Hunter Creek-Truckee River 160501020505	Truckee	Poeville
Headwaters Long Valley Creek 180800031201	Honey-Eagle Lakes	Mitchell Peavine Poeville Peavine/Poeville
Cold Spring Valley 180800030902	Honey-Eagle Lakes	Poeville
Lemmon Valley 180800030901	Honey-Eagle Lakes	Poeville

2.3 SOILS

The NRCS has mapped soils within the region and identified over 100 different soil mapping units within the analysis area (**Appendix B**). For each soil unit, the NRCS assigns an erosion potential based on its characteristics and how they are affected by wind and water. Using soil erosion K factor, slope, and rock fragment content, the NRCS also rates soils according to the potential for soil loss from unsurfaced roads and trails. The rating categories of hazard are described as "slight,""moderate," or "severe." A rating of "slight" indicates that little or no erosion is likely; "moderate" indicates that some erosion is likely, that the roads or trails may require occasional maintenance, and that simple erosion-control measures are needed; and "severe" indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed (NRCS 2012). Because the construction of unsurfaced roads is an important feature of the project, soil hazard ratings were used as an impact indicator rather than soil erosion potential. All Action Alternatives would be constructed predominantly in soils with a severe erosion hazard rating (**Figures 4-8**).

2.4 STREAMS

JBR surveyed streams in the ROW during field studies on May 28 and 29, 2012. The survey included classifying streams according to whether it carried perennial, intermittent, or ephemeral flow. When woody riparian vegetation was present, the relative condition of the riparian zone was assessed. For the purposes of the classification, an ephemeral stream was defined as a stream conveying water only in response to precipitation events. The period of flow is so short that the streams do not have adequate soil moisture to support woody riparian vegetation. An intermittent

stream was defined as a stream conveying flows on a seasonal basis for a longer duration than an ephemeral stream because the stream intercepts flows from a spring, seep, or a high water table. Intermittent streams are dry in summer. The longer period of flow allows for the establishment of woody riparian and/or herbaceous wetland communities. On streams that did not have flow during the field survey, the presence of a narrow corridor of woody riparian or herbaceous wetland vegetation was used as a field indicator of intermittent stream flow. Perennial streams have flows year-round, and woody riparian and wetland communities are generally well developed. It should be noted that classification of stream types were made from observations taken within the project area. Streams classified as intermittent and perennial streams may be ephemeral or intermittent in their lower reaches, outside the study area. Six streams that were not assessed during field studies due to difficult or no available access were assessed through aerial photography and USGS topographic maps. Flow regime and presence of riparian vegetation was determined using aerial imagery, but no attempt was made to evaluate stream condition.

A total of 40 stream segments occur within the variable width corridor of Action Alternatives, consisting of 8 perennial streams, 11 intermittent streams, and 21 ephemeral streams. Each stream segment is numbered and shown on **Figure 3**. The numbering system counts the Truckee River, Bull Ranch Creek, and Dog Creek twice as they cross into the analysis area twice. The width of streams ranged from one foot-wide on small ephemeral channels to the 200 feet-wide on the Truckee River. Within the road widening corridors, existing roads cross 1 perennial stream (Sunrise Creek), 3 intermittent streams (Bull Ranch Creek, Brooklyn Creek, and Jones Creek), and 11 ephemeral streams. **Tables 8** and **9** summarize the number of streams by flow regime that are found within the variable width corridor and the road widening corridors for each alternative. There are no streams of any type on land administered by BLM.

Table 8 Number of Streams by Flow Regime Within Variable Width Corridor

Stream Flow Regime	Mitchell (quantity)	Peavine (quantity)	Poeville (quantity)	Peavine/Poeville (quantity)
USFS				
Perennial	1	1	0	1
Intermittent	2	1	5	0
Ephemeral	5	7	1	7
Total	*8*	*9*	*5*	*8*
All Land				
Perennial	2	2	5	4
Intermittent	4	3	6	3
Ephemeral	5	7	12	7
Total	*11*	*12*	*20*	*14*

Sources: JBR Field Investigation, USGS topographic maps, and aerial photography

Table 9 Number of Streams by Flow Regime Within Road Widening Corridors

Stream Flow Regime	Mitchell (quantity)	Peavine (quantity)	Poeville (quantity)	Peavine/Poeville (quantity)
USFS				
Perennial	0	0	0	0
Intermittent	1	1	0	1
Ephemeral	2	5	0	4
Total	*3*	*6*	*0*	*5*
All Land				
Perennial	1	1	1	1
Intermittent	1	1	2	2
Ephemeral	2	6	8	7
Total	*4*	*8*	*11*	*10*

Sources: USGS topographic maps and aerial photography

The analysis area for the Poeville Alternative contains the most streams, but few streams occur on NFS land. This is because only 23 percent of the Poeville Alternative is on NFS land. Considering public and private land combined, the analysis area for the Mitchell Alternative contains the fewest streams.

2.5 RIPARIAN CONDITION

2.5.1 JBR Survey

The condition of riparian areas within the variable width corridor for each alternative was also assessed during the field survey. Streams on public and private land were assessed. A rating criteria was developed specifically for this project, modifying stream evaluation procedures developed by USACE (USACE 2011). The riparian condition (**Table 10**) was rated based on the following:

Optimal – Native woody species greater than 60 percent cover and wetlands present; no grazing; no invasive species.

High Suboptimal – Native woody species greater than 60 percent cover; no wetlands present or native community species 30 to 60 percent with wetlands; no grazing; no invasive species.

Low Suboptimal – Native woody species 30 to 60 percent cover; no wetlands; no grazing; no invasive species.

Marginal – Native woody species less than 30 percent cover; bare soil greater than 25 percent; invasive species.

Poor – Sparsely vegetated; native woody species less than 30 percent cover; bare soil greater than 25 percent; invasive species present; grazing.

Severe – Very sparsely vegetated; bare soil greater than 40 percent; invasive species present; no native species present; grazing.

Although no livestock grazing occurs on NFS land, grazing was included as an evaluation criteria because it had a observable effect on riparian conditions on private land. Photographs of riparian conditions recorded are provided in **Appendix C**. Streams in the best condition were found on NFS land.

Table 10 Riparian Condition of Perennial and Intermittent Streams

Stream Name	Stream Identifier	Stream Type	Riparian Width	Observed Riparian Condition/Vegetation	Alternatives	Land Status
No Name	1	Intermittent	5 feet	Not Rated	Mitchell Peavine Peavine/Poeville	Private
No Name	2	Intermittent	5 feet	Not Rated	Mitchell Peavine Peavine/Poeville	Private
No Name	7	Intermittent	15 feet	Not rated. This is an ephemeral stream, but is cataloged as an intermittent stream because of a wetland spring just outside of the stream channel. Wetland has an aspen and willow overstory.	Mitchell	
Dog Creek	9	Perennial	32 feet	High to Low Suboptimal – Willow.	Mitchell	USFS
Dog Creek	12	Perennial	5 feet	Not Rated	Peavine	
South Branch Dog Creek	14	Intermittent	15 feet	Marginal – Pine, willow, and bitterbrush.	Mitchell Peavine	USFS
Sunrise Creek	15	Perennial	15 feet	High Suboptimal – Willow, bitterbrush, wild rose, alder, and ponderosa pine at the margins.	Mitchell Peavine	Private
Jones Creek	17	Perennial	20 feet	Low Suboptimal – Wild rose, sagebrush, willow, mules ear, and horsebrush.	Poeville	USFS
No Name	20	Intermittent	2 feet	High Suboptimal – Grasses, wild rose, lupine and pepperweed, pine, sagebrush encroachment at margins.	Poeville	USFS
No Name	21	Intermittent	2 feet	High Suboptimal – Grasses and sedges, sagebrush encroachment and greasewood at margins	Poeville	USFS
No Name	23	Intermittent	10 feet	Severe – Grasses, sedges, wild rose, pepperweed, and cottonwood.	Poeville	USFS and Private
No Name	26	Intermittent	10 feet	Severe – Willow, Scotch thistle, sagebrush, Russian thistle, and mules ear.	Poeville	USFS and Private
Brooklyn Creek	28	Intermittent	0 to 70 feet	Severe – JBR wildlife biologist and botanist noted the poor condition of the aspen and willow riparian communities due to the presence of the road, damage from vehicle disturbance, and heavy browse by deer.	Poeville	Private
Bull Ranch Creek	34	Perennial	16 feet	Poor. Vegetation consists of willow, Scotch thistle, cheatgrass, sagebrush (encroaching on stream), and bitterbrush.	Poeville Peavine/Poeville	Private
Truckee River	35	Perennial	18 feet west, 30 feet east	Low Suboptimal – Vegetation consists of alder, willow, wild teasel, poison hemlock, and pepperweed.	Poeville Peavine/Poeville	Private
Truckee River	36	Perennial	65 feet	Low Suboptimal – Vegetation consists of cottonwood, willow, alder, wild teasel, poison hemlock, and pepperweed.	Poeville Peavine/Poeville	Private

Stream Name	Stream Identifier	Stream Type	Riparian Width	Observed Riparian Condition/Vegetation	Alternatives	Land Status
Bull Branch Creek	38	Perennial	25 feet	Not Rated	Peavine/Poeville	USFS
No Name (tributary of Bull Ranch Creek)	39	Intermittent	0-15 Localized around seep	Not Rated	Peavine/Poeville	USFS and Private
No Name	40	Perennial	35	Not rated. Wet meadow is supported by seepage or flows from a private reservoir.	Poeville Peavine/Poeville	Private

Sources: JBR Field Investigation, USGS topographic maps, and aerial photography

2.5.2 NDEP Watershed Assessment

Within and in proximity to the analysis area, Dog Creek and Sunrise Creek have been studied on a regular basis as a part of a regional watershed assessment. Washoe County Department of Water Resources, University of Nevada Cooperative Extension, and the Washoe-Storey Conservation District produced "*Watershed Assessment for Tributaries to the Truckee River*" (Hillside Design 2011) in order to develop management and protection strategies that would ultimately improve the condition of the Truckee River. The report describes the assessment criteria, methods, and the findings for major creeks in the watershed.

While certain problems were identified for Dog Creek and Sunrise Creek, the County's assessment determined that Dog Creek and Sunrise Creek were in proper functioning condition and considered the creeks to be in an upward (improving) trend. The assessment concluded that observed hydrology, vegetation, erosion, and deposition are all appropriate for the setting. According to the assessment, the floodplain of Dog Creek is "inundated and vegetation is robust and expanding following wet season." The channel geometry in the meadow setting of Sunrise Creek "continues to evolve towards a stable condition, and vegetation is very robust following a wet season and prolonged streamflows." Management recommendations for Dog Creek include developing a plan for a ranch property and developing and implementing a weed management plan. For Sunrise Creek, recommendations for management are to install Best Management Practices (BMPs) to limit erosion and sediment at road crossings and drainages.

2.6 WETLANDS

Wetlands in the analysis area were identified through vegetation maps available from Humboldt-Toiyabe National Forest (GIS dataset), field surveys, and interpretation of aerial photographs. A delineation using the technical criteria from the Corps' delineation manual was not performed. For the purposes of the analysis, the general definition of wetland from USACE and the Environmental Protection Agency (USEPA) regulation in 40 CFR 230.3 and 33 CFR 328.3 was used:

> Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

In this report, the term "wetland" is used interchangeably with the term "meadow" referenced in Design Features **(Section 1.2.4**). Design feature WA 2(e) provides the definition of meadows:

> Meadows are defined by predominately grass like plants and / or riparian vegetation which is dependent upon an elevated water table during a portion of

the growing season. This would include narrow wetland "stringer meadows" which are adjacent to intermittent streams as well as drier, upland meadow sites. Meadow areas contrast with the shrub steppe and mountain brush communities throughout the analysis area by the absence of upland shrubs.

Within the analysis area, wetlands are found along the margins of intermittent and perennial streams and include the riparian community described in the previous section. Along most streams intermittent and perennial streams, wetlands are dominated by willow shrubs. Along a few streams, wetlands are dominated by hydrophytic grasses and forbs. Additional wetlands occur outside of stream riparian zones and are associated with isolated springs and seeps. These isolated wetlands are generally dominated by grasses and forbs. **Table 11** show the acreage of wetlands that are found along each Alternative.

Table 11 Wetlands within Analysis Area

Analysis Area	Mitchell (acres)	Peavine (acres)	Poeville (acres)	Peavine/Poeville (acres)
USFS				
Variable Width Corridor	0.6	0.1	3.9	1.1
Road Widening Corridors	1.0	1.1	0.0	1.1
All Land				
Variable Width Corridor	13.7	13.2	14.1	21.8
Road Widening Corridors	1.1	1.4	0.2	1.3

Sources: JBR Field Investigation and aerial photography

On NFS land, the variable width corridor of the Poeville Alternative contains the most wetlands, even though on NFS land, the alternative contains the fewest number of streams. The higher acreage of wetlands is attributed to approximately 0.5 mile of riparian corridor along stream #26 that occurs within the Poeville analysis area. On NFS land, the Peavine Alternative contains the fewest wetlands. Considering public and private land combined, the variable width corridor of the Peavine/Poeville Alternative contains the most wetland, and the Peavine Alternative contains the fewest wetlands. Within road widening corridors, the Peavine Alternative contains the most wetlands, while the Poeville Alternative contains the fewest wetlands on both public and private land.

2.7 WATERS OF THE UNITED STATES AND WATERS OF THE STATE

Streams and wetlands within the project area were evaluated to determine whether these features would be considered a water of the United States subject to regulation under the CWA (**Appendix A**). The evaluation concluded that not all streams in the study area would be considered a water of the United States. Federal jurisdiction would be limited to those stream segments that cross the California and Nevada state line, as well as perennial, intermittent, and

ephemeral streams and their adjacent wetlands that drain to the Truckee River. Perennial, intermittent, and ephemeral streams and their adjacent wetlands that drain toward Lemmon and Cold Spring Valleys would not be regulated under Section 404 of the Clean Water Act. The Poeville Alternative is the only alternative that has streams that drain toward Lemmon Valley and Cold Spring Valley. Regardless of their federal status, all surface waters and wetlands within the study area would be considered waters of the State by the respective states in which they occur.

2.8 FLOODPLAINS

According to FEMA regulations 44 CFR 59.1, a floodplain is any land area susceptible to being inundated by water from any source. "Special flood hazard areas" are areas of land that would be inundated by a flood having a one-percent chance of occurring in any given year (also referred to as the base flood or 100-year flood). Special flood hazard areas are delineated on FEMA's flood insurance rate maps. The Truckee River is the only special flood hazard area within the study area (FEMA 2012). The Poeville and Peavine/Poeville Alternatives cross the Truckee River twice (Stream #35 and #36) (**Figure 4**).

2.9 WATER QUALITY

Streams within the Dog Creek and Hunter Creek-Truckee River sub-watersheds drain to the Stateline to Idlewild reach of the Truckee River. The Stateline to Idlewild reach (NV06-TR-02_00) is a CWA 303(d)-listed impaired water body (NDEP 2012). Inclusion on the 303(d) list means the reach does not meet state water quality standards. Water quality standards for beneficial uses of this reach have been met for livestock irrigation, recreation, municipal or domestic supply, industrial supply, and propagation of wildlife. However, since the last reporting period, the reach failed to meet water quality standards for the aquatic life beneficial use category because of high water temperature. The Stateline to Idlewild reach was previously listed on the 303(d) list due to high suspended sediment and turbidity, but has since been delisted for this parameter because monitoring has shown that the reach meets water quality standards for sediment and turbidity. All Action Alternatives either cross the Stateline to Idlewild reach of the Truckee River or cross tributaries that flow into this reach.

The remaining streams within the analysis area are a part of the Headwaters Long Valley Creek, Cold Spring Valley, Lemmon Valley subwatersheds. These streams do not drain into a waterbody that is a CWA 303(d)-listed impaired water body (CWRCB 2010) (NDEP 2012).

3.0 ENVIRONMENTAL CONSEQUENCES

3.1 INDICATORS

The potential effects to watershed resources are primarily derived by comparing the foreseeable changes that construction, operation, and maintenance activities would have on watershed attributes that currently exist, as described in **Section 2.0**. The specific indicators that were used to evaluate effects to water and soil resources are:

- Acreage of soils permanently lost or displaced;
- Acreage of soils temporarily disturbed. Disturbance to soils reduces soil function and increase erosion;
- Acreage of soils that have a severe erosion hazard rating;
- Number of streams within soils that have a severe erosion hazard rating. Streams in highly erodible soils have an increased risk of sedimentation;
- Number of constructed fords and unimproved crossings on streams within soils that have a severe erosion hazard rating. Construction of new roads across streams may contribute to changes in stream function and sedimentation in streams;
- Number of constructed fords and unimproved crossings on streams that have wetland and/or riparian areas; and
- Compliance with applicable state and federal water quality discharge regulations.

3.2 METHODS OF ANALYSIS

NEPA requires that effects be discussed in terms of context and intensity. In this report, context refers to the location, type, or size of the area to be affected relative to each resource component. Intensity refers to the severity or level of magnitude of impact. The intensity of effects in this report is defined as "Major", "Moderate", "Minor", or "Negligible". In addition, the duration of effects can be "Temporary", "Short-term", or "Long-term". These terms are described more specifically in **Table 12**.

Table 12 Definition of Levels of Effect

Level of Effect		Description Relative to Watershed Resources
Magnitude	Negligible	No measurable change in current conditions
	Minor	A small, but measureable change in current conditions
	Moderate	A moderate measureable change in current conditions
	Major	A large, easily measureable change in current conditions

Level of Effect		Description Relative to Watershed Resources
Duration	Temporary	Occurring during construction and maintenance activities
	Short-term	10 years or less
	Long-term	More than 10 years

The exact location of construction disturbances such as pole sites, wire stringing sites, line clearance areas, staging areas (on private land), log landings, skid disturbances, centerline travel roads, and other temporary access roads are not known until an alternative is selected through the NEPA process and a final design is engineered. However, NV Energy intents to keep the all construction disturbances, including log landings, centerline travel roads, and temporary access roads inside the variable width corridor. Reported acreages for impacts within the road widening corridor would be less than what is reported, as not every road analyzed would be widened up to 30 feet.

3.3 DIRECT AND INDIRECT EFFECTS

3.3.1 No Action

Under the No Action Alternative the transmission line would not be built. The No Action Alternative would result in no increase in vegetation clearing or ground disturbance and would have no direct or indirect effects on water or soils.

3.3.2 Effects Common to All Action Alternatives

3.3.2.1 Construction

Direct and Indirect Effects to Soils

1. **Soil loss or displacement.** Loss of soil substrate would occur in areas of pole installation and at the Bordertown Substation. Installation of poles would displace an area of soil measuring 23 inches in diameter (0.0003 acre) for each pole. The total amount of soil displacement would vary depending on the type of structure installed (e.g., single-pole, two-pole H-frame, or three-pole dead-end/angle structure). Self-supporting pole structures on concrete foundations, which would only be used where the ROW is constrained, would displace an area of soil measuring 3 to 12 feet in diameter for each foundation. In contrast, the replacement of pole structures would have little to no area of new soil displacement. An average of 7 poles per mile can be expected. All Action Alternatives would require the expansion of the Bordertown substation, permanently impacting up to 3.7 acres of substrate.

2. **Loss of soil function**. The disturbance to soils would result in a loss of soil function. At each new pole structure site, a 85- to 120-foot radius surrounding the pole structure would be disturbed. Temporary access roads and road widening areas would be graded up to 30 feet wide. Soils would also be disturbed within line clearance areas incidental to tree removal activities, within an 80-foot wide corridor inside the ROW, generally at midspan.

   Soil compaction would occur to varying degrees within most disturbed areas of the project. Driving of vehicles along the centerline access road, spur roads, and widened roads would compact soils in that location. If heavy equipment is used for tree removal, use of heavy equipment would compact soils. Soils at pole foundations would be deliberately compacted to support structures. Soils in temporary staging areas, which would be placed only on private land, would be compacted by vehicles, equipment, activity, and storage of materials. Soil compaction would inhibit water infiltration, increase runoff rates, restrict root growth, reduce soil aeration, and possibly affect soil microbiota.

3. **Increased erosion and runoff from vegetation removal.** Construction would cause the removal of vegetation. Once vegetation cover is removed, exposed soils would be more susceptible to splash erosion and would have increase runoff rates. Vegetation would be cleared at most work sites, and in other areas, vegetation cover would be lost from construction disturbance. For example, the centerline travel roads would not be routinely cleared of vegetation, but repeated travel on the routes may result in the loss of effective ground cover. In line clearance areas, trees would be removed, and effective ground cover could be removed incidental to kidding operations. Steep slopes, which are common throughout the analysis area, would increase the potential for erosion.

To assess the potential for impacts to soils from construction, the acres of permanent and temporary disturbance, acres of forested community, and acres of soils that have a severe erosion hazard were evaluated for each alternative (**Figures 4-8**).

All Action Alternatives would be constructed predominantly in soils with a severe erosion hazard rating (**Figure 4**). The primary methods of minimizing the potential for erosion is through implementation of BMPs, implementation of design features, and restoration of disturbed areas. A Storm Water Pollution Prevention Plan (SWPPP) would be developed once an Action Alternative is selected, which would identify specific BMPs that would be implemented throughout construction. To ensure the efficacy of erosion and siltation controls identified in the SWPPP, inspections would be made at least once per week and before and after rain events. Use of BMPs are reinforced by design features WA 1, WA 2, and WA 3. Design feature WA 3

ensures that inspections would be made by qualified personnel of NV Energy or its contractors, and that maintenance of BMPs would occur on a frequent and regular basis.

Additional methods would be used during construction to minimize the potential for erosion. Woody branches would be chipped and spread over the surface of the access road and adjacent areas to serve as erosion controlling mulch and reduce fuel loading. Design feature VG 6 specifies that chips would be incorporated into the soil, as needed. To encourage rapid regrowth of vegetation and minimize soil erosion, design feature VG 5 specifies that shrub vegetation would be cleared primarily by mowing or chopping vegetation in a manner that leaves root systems intact.

Effects of compaction can be short-or long-term, however, construction practices would reduce the potential for long-term effects. Upon project completion, disturbed sites would be restored. Restoration of disturbed areas under all Action Alternatives would routinely include loosening of compacted soils prior to seeding. To minimize the potential for soil compaction during construction, design feature SO 1 would prohibit the use of heavy equipment when soils are wet under all Action Alternatives.

Restoration of disturbed areas would begin as soon as construction is complete. Log landings and skid disturbances would also be restored. Successful revegetation of disturbed sites would indicate the recovery of soil function. Under all Action Alternatives, revegetation would be monitored annually and would be measured against success criteria. Under a best case scenario, it would take approximately 3 to 5 years to meet success criteria, at which time, soils would be adequately stabilized. Short-term (i.e., 10 years or less) soil stabilization is expected but the time period would be directly related to the type, intensity, and duration of the disturbance. Soil function for areas lightly disturbed would recover rapidly with site restoration. Areas that may recover less rapidly include sites that were heavily disturbed during construction, sites that are less ecologically resilient, and sites that are subject to continual disturbance during the recovery period. Less ecologically resilient sites include xeric sites on south facing slopes, steep slopes, and areas with little soil. Revegetation success and soil stabilization on reclaimed access roads would be slow if repeated damage from unauthorized off highway vehicle (OHV) use occurs. However, the OHV use of reclaimed roads on NFS land would be minimized as much as possible through design features RT 7 and RT 8 which require the effectiveness of blockades to be evaluated and, if necessary, monitored by USFS OHV rangers until reclamation is successful.

The permanent loss of soils would have a long- term impact, but impacts would be minor because the area of impacts are relatively small. Impacts to soil from compaction, loss of ground cover, and soil erosion would be short-term where BMPs and design features are effectively applied. The temporary disturbance to soils would not affect long-term soil productivity where reclamation. Impacts would be minor, and would attenuate over time as ground cover is restored.

Direct and Indirect Effects to Streams

1. **Surface disturbance to streams**. With the implementation of design features WA 5, SV 3, and SV 6, which prohibit construction in meadows, wetlands, stream riparian zones, and 100-year floodplains on NFS land, no impacts to streams would occur on NFS land with the exception of intermittent drainages #19 and #20 (along the Poeville Alternative). Other design features would further protect streams from direct and indirect impacts. On both public and private land, WA 4 would keep staging areas away from streams; WL 9 prohibits construction within the 100-year floodplain of Dog Creek and the Truckee River; and design feature WA 5 and SV 6 prohibits poles within the 100-year floodplain of any stream or wetland. Design feature WA 5 further requires that roads be placed away from streams as much as practicable. To heighten awareness of these sensitive vegetation communities during construction, design features GP 1 and SV 4 require these communities to be flagged.

   With the exception of intermittent drainages #19 and #20, no construction of ford crossings would be allowed on perennial and intermittent streams on NFS land in order to protect wetland and riparian vegetation. However, crossings for centerline access roads, spur roads, and roads proposed for widening could directly and indirectly impact intermittent and perennial streams that occur on private land; and ephemeral streams that occur on both public and private land. Ephemeral streams would not likely need improvements, particularly if the streams have a cobble bed, or do not have a well defined bed and bank. Where ford crossing are constructed, the side-slopes of the drainage would be laid back to a slope that allows for safe vehicle travel. If needed, the slopes and drainage bottom would be rock-armored to protect the channel bed and bank. Once construction is complete, the crossing would be recontoured, de-compacted, stabilized, and seeded with agency-approved seed mixes. Where riparian vegetation has been removed, vegetation would be replaced.

   To assess the potential for construction impacts from road crossings, the number of stream crossings within soils that have a severe erosion hazard rating was evaluated for each alternative. The assessment assumes the maximum number of crossings, although design feature WA 5 requires that the number of crossings on NFS land be reduced as much as practicable.

   Impacts associated with road crossings would include bank alterations, and possibly bed alterations if armoring is needed. (Riparian vegetation and sedimentation impacts are discussed separately below.) Impacts would be short-term and negligible to minor for a number reasons. The primary reason that crossings would have no more than a minor impact is because ephemeral streams carry very little flow, for a short duration, in

response to precipitation or snow melt. Ephemeral streams would generally not be flowing during the majority of the construction period. Any potential impact that could occur, would be minimized through a number of Forest Plan requirements and design features. Design feature RT 2 requires that road construction on NFS land, including crossings, be constructed to USFS road construction handbooks and SV 3 require compliance with Forest Plan standards and guidelines. Design feature WA 6 requires that any crossing on public or private land be designed and located in manner that minimizes disturbance to the stream and design features. Additionally, the Forest Plan and Section 404 CWA Nationwide Permit 12 Regional Condition 6c, require that construction of improved road crossings occur when the streams are dry. WA 2 and WA 8 require that improved crossings would be regularly monitored and that any repairs or improvement would be promptly addressed. To ensure that all improvements would be temporary design features WA 7 and RT 5 would ensure that crossings would be fully reclaimed and restored. Design feature WA 7 also requires that after construction when the need for the crossing no longer exists, the crossing would be removed and the stream substrate would be restored.

2. **Sedimentation.** Erosion of soils could impact streams if sediment laden runoff reached streams. Streams in the analysis area are generally prone to sedimentation because the majority of streams are ephemeral and naturally do not have enough flow to support a riparian corridor. Field studies documented a number of perennial and intermittent streams in the study area that are sparsely vegetated with a riparian zone in marginal to severe riparian condition (**Section 2.5**). All Action Alternatives contain types of streams that are prone to sedimentation. Steeper slopes that are prevalent along all Action Alternatives increase the risk for sedimentation.

To assess the potential for construction impacts to streams, the number of streams within soils that have a severe erosion hazard rating was evaluated for each alternative.

Minimizing the potential for sedimentation of streams would rely primarily on the revegetation of disturbances, BMPs, and design features. Some design features would minimize soil erosion, and other design features do not allow certain types of construction or activity near streams. On both public and private land, WA 4 and WA 5 keep staging areas away from streams, and design feature WA 5 and SV 6 prohibits poles within 100-year floodplain of any stream or wetland. WA 5 also requires that roads be placed away from streams as much as practicable. Regular monitoring of the efficacy of erosion and siltation controls on access roads and road crossings (design features WA 3 and WA 8) would further minimize impacts from sedimentation.

Impacts to streams from sedimentation would be short-term and minor where reclamation is successful and BMPs and design features are effectively applied. The risk of sedimentation would attenuate over time as ground cover is restored.

Direct and Indirect Effects to Riparian Areas and Wetlands

With the implementation of design features WA 5, SV 3, and SV 6, Action Alternatives would avoid direct impacts to meadows, wetlands, and stream riparian zones on NFS land. On private land, staging areas and poles would be kept away from wetlands and riparian zones, and therefore, impacts to these sensitive areas could only occur from the construction of access roads across intermittent and perennial streams. The exception is Dog Creek and the Truckee River. Design feature WL 9 prohibits construction within the 100-year floodplain of Dog Creek and the Truckee River.

Loss of meadow, wetland, and riparian vegetation would result in the loss of effective ground cover, and make soils more susceptible to splash erosion. If these communities occur along streams, soils along stream banks would be more susceptible to erosion from streams flows. To assess the potential for construction impacts from road crossings, the number of potential crossings of streams containing meadows, wetland, and riparian zones on private land were evaluated (**Figures 4-8**).

The restoration of disturbed vegetation would begin as soon as construction is complete, and reclamation standards require that ground cover be established on restored areas within 5 growing seasons. On public and private land, design feature VG 4 would require where possible, that shrubs will be cut at ground level to preserve the root structure and allow for potential sprouting. To ensure the restored community would attain the appropriate plant community composition over time, the success criteria that would be used for reclaimed vegetation would be based on a reference site selected by the USFS. Short-term (i.e., 20 years or less) recovery of meadow, wetland, and riparian vegetation is expected. Construction of roads through isolated meadows and wetlands away from streams is unlikely because roads can be placed to avoid these features.

With the successful reclamation and recovery of riparian and wetland communities, impacts to these areas would be short-term and minor. Any measurable effects would attenuate overtime as the vegetation recovers.

Direct Effects Waters of the U.S. and Waters of the State

All channels in the analysis area would fall under jurisdiction of LRWQCB or NDEP depending on the state in which they occur. If crossing require improvements, both agencies would allow constructed crossings under the NPDES program. LRWQCB would permit crossings under a

general construction permit and NDEP would permit crossings under a temporary working in waterways permit. Both agencies would require BMPs to be implemented to control erosion and sedimentation as a condition of authorization.

Only ephemeral channels in the Dog Creek, Bull Ranch Creek and Hunter Creek watersheds would be regulated by the USACE (**Appendix A**). Impacts to ephemeral channels that are waters of the United States would be allowable under the USACE's CWA Section 404 permitting program using Nationwide Permit 12 used for the construction, maintenance, and repair of utility lines and associated facilities. In California, the terms of a Section 401 Water Quality Certification would prohibit the permanent placement of armoring material in the stream but would allow temporary placement of armoring for up to 90 days. Additionally, restoration of stream would need to be completed within 30 days of completion of project construction (CWRCB 2012).

Indirect effects (e.g., sedimentation) to ephemeral channels that are considered Waters of the U.S. and Waters of the State are discussed under stream impacts above. With implementation of design features and implementation of any general or special conditions of state and federal permits, impacts to Waters of the U.S. and Waters of the State would be short-term and minor.

Direct and Indirect Effects to Water Quality

Construction impacts to water quality could occur locally on a small scale, where increased erosion and sedimentation as a result of surface disturbance could contribute to turbidity levels in surface drainages outside of state regulations. Construction impacts to water quality could also occur regionally, where contributions from several surface water systems affect the Stateline to Idlewild reach of the Truckee River listed on the state's 303(d) list. All Action Alternatives either cross the Stateline to Idlewild reach of the Truckee River or cross tributaries that flow into this reach.

Although suspended sediment and turbidity was not identified as a problem in Stateline to Idlewild reach, design features specific to soil, water resources, vegetation, sensitive vegetation, and roads (**Section 1.2.4**) would reduce the risk of water quality impacts from roads and project construction. NV Energy intends to leave all existing roads in a condition equal to or better than their preconstruction condition (design feature RT 12), and would immediately reclaim disturbances. Additionally, state and federal permitting requirements discussed in the sections above would serve to minimize impacts to water quality and any contributions of suspended sediment and increased turbidity.

Surface water may be affected by leaking oil, gas, hydraulic fluid, etc. from construction equipment, particularly at equipment staging areas. If spills of polluting substances were to reach

perennial, intermittent, or ephemeral stream systems, the level of significance of the spill event would depend on the polluting material, the amount of pollutant entering the stream, and the conditions of the stream. Under all Action Alternatives, a spill prevention plant would be developed as a part of the COM plan for all construction areas where hazardous materials would be stored or utilized, and all construction personnel operating equipment would be trained in identifying spills and in the proper notification/cleanup procedures. Such a plant would include guidance on storage, refueling, and lubrication procedures and locations, as well as BMPs regarding spill prevention and cleanup procedures. Design features WA 1 and WA 4 would prevent water quality impacts to streams from spills at staging areas by keeping staging areas well away from any streams. Potential impacts to water quality are unlikely assuming design features, the spill prevention plan, and BMPs are implemented.

3.3.2.2 Operation and Maintenance

Under all Action Alternatives, new facilities are not anticipated during the operation and maintenance phase of the project, and therefore, the permanent loss of soil substrate is not anticipated. However, temporary disturbance to soils would occur, but would not be intensive and would occur on an infrequent to rare basis. Annual inspections would be made via helicopter or by walking in from the nearest existing road. Tree removal under transmission line wires would occur on a 10-year cycle. The magnitude of disturbance would be less than during construction because of the fewer number and smaller size of trees. The need for a repair would be rare particularly with the use of steel poles. Should repairs be needed, disturbance would be localized, and likely to occur on construction disturbances that have been reclaimed, which would avoid new disturbance to habitat. The magnitude of disturbance would be less intensive than construction due to the shorter duration of maintenance activities and the use of fewer equipment and vehicles. Restoration would begin as soon as repairs are complete, and would include stabilization of soils. With reclamation of disturbances and implementation of BMPs and design features, soil disturbance, soil compaction, loss of ground cover and erosion and runoff, operation and maintenance of any of the Action Alternatives would have a short-term negligible to minor direct and indirect effect on soil productivity.

Direct and Indirect Impacts to Streams

Soil disturbance from the use of access roads and from major and minor repairs may cause sediment laden runoff into streams, but episodes of disturbance would be infrequent. Disturbance would generally be less intensive, and areas of disturbance would be localized. Soils would be stabilized by reclamation (if needed) and BMPs and design features (**Section 1.2.4**) would be implemented. Operation and maintenance of any of the Action Alternatives would have a short-term negligible to minor direct and indirect effect on streams.

Direct and Indirect Effects to Riparian Areas and Wetlands

Disturbance to meadow, wetland and riparian vegetation from the use of access roads may occur, but recovery of the vegetation community is expected. Episodes of disturbance would be infrequent, disturbance would generally be less intensive, and areas of disturbance would be localized. Under all Action Alternatives, disturbances would be reclaimed and BMPs and design features would be implemented during the operation and maintenance phase of the project. Operation and maintenance of any of the Action Alternatives would have a short-term negligible to minor direct and indirect effect on riparian areas and wetlands.

Direct Effects Waters of the U.S. and Waters of the State

Impacts to jurisdictional wetlands and waters of the United States for maintenance would be allowable under the USACE CWA Section 404 permitting program provided that it can meet the conditions of Nationwide Permit 3 for Maintenance (USACE 2012). Nationwide Permit 3 allows for activities related to the repair, rehabilitation, or replacement of any previously authorized structure, which in this case would be the constructed fords. 401 Water Quality Certification by LRWQCB or NDEP would be needed in order for the permit to be valid.

Indirect effects (e.g., sedimentation) of operations and maintenance to ephemeral channels that are considered Waters of the U.S. and Waters of the State are discussed under stream impacts above. With implementation of BMPs and design features, and implementation of any general or special conditions of state and federal permits, impacts to Waters of the U.S. and Waters of the State would be short-term and minor to negligible.

Direct and Indirect Effects to Water Quality

Episodes of construction disturbance would be infrequent, disturbance would generally be less intensive, and areas of disturbance would be localized. With reclamation of site disturbance, implementation of design features, and compliance with any general or special conditions of state and federal permits, impacts to water quality would be short-term and negligible to minor.

3.3.3 Mitchell Alternative

Project impacts for the Mitchell Alternative are presented in **Tables 13** and **14** below. A comparison of Alternatives is contained in **Section 3.3.7**. Areas of soils with a severe hazard rating is shown on **Figure 5**.

3.3.3.1 Construction

Table 13 Mitchell Alternative Effects to Soils

Impact Indicator	USFS (acres)	All Land (acres)
Soils Permanently Lost	0.07	3.79
Soils Temporarily Disturbed		
Line Clearance Area (forested vegetation community)	39.81	39.81
Pole Structure Installation	33.25	48.83
Wire Pulling	104	156
Construction Staging	0	22.8
Centerline Travel Road	22.2	25.8
Road Widening (outside of the variable width corridor)	17.03	28.25

Table 14 Mitchell Alternative Effects to Other Watershed Resources

Impact Indicator	USFS			All Land		
	ROW	Variable Width Corridor	Road Widening	ROW	Variable Width Corridor	Road Widening
Soils Rated Severe Erosion Hazard (acres)	91.2	595.4	14.6	100.5	652.9	19.0
Streams within Soils Rated Severe Erosion Hazard (quantity)	8	8	3	9	9	4
Road Crossings within Soils Rated Severe Erosion Hazard (quantity)	5	5	2	6	6	3
Wetland/Riparian Road Crossings (quantity)	0	0	0	1	1	1

3.3.3.2 Operation and Maintenance

Impacts from the operation and maintenance of the Mitchell Alternative would be less than those posed by construction activities (**Tables 13** and **14**). Episodes of maintenance would be infrequent and less intensive due to the shorter duration of maintenance activities and the use of fewer equipment and vehicles.

3.3.4 Peavine Alternative

Project impacts for the Peavine Alternative are presented in **Tables 15** and **16** below. A comparison of Alternatives is contained in **Section 3.3.7**. Areas of soil with a severe hazard rating are shown on **Figure 6**.

3.3.4.1 Construction

Table 15 Peavine Alternative Effects to Soils

Impact Indicator	USFS (acres)	All Land (acres)
Soils Permanently Lost (poles and substation expansion)	0.07	3.79
Soils Temporarily Disturbed		
Line Clearance Area (forested vegetation community)	21.09	21.09
Pole Structure Installation	27.53	43.12
Wire Pulling	104	156
Construction Staging	0	22.8
Centerline Travel Road	23.6	27.3
Road Widening (outside of the variable width corridor)	29.02	52.92

Table 16 Peavine Alternative Effects to Other Watershed Resources

Impact Indicator	USFS			All Land		
	ROW	Variable Width Corridor	Road Widening	ROW	Variable Width Corridor	Road Widening
Soils Rated Severe Erosion Hazard (acres)	76.5	495.2	26.2	85.08	555.5	42.8
Streams within Soils Rated Severe Erosion Hazard (quantity)	9	9	6	10	10	9
Road Crossings within Soils Rated Severe Erosion Hazard (quantity)	7	7	5	8	8	8
Wetland/Riparian Road Crossings (quantity)	0	0	0	5	5	2

3.3.4.2 Operation and Maintenance

Impacts from the operation and maintenance of the Peavine Alternative would be less than those posed by construction activities (**Tables 15** and **16**). Episodes of maintenance would be infrequent and less intensive due to the shorter duration of maintenance activities and the use of fewer equipment and vehicles.

3.3.5 POEVILLE ALTERNATIVE

Project impacts for the Poeville Alternative are presented in **Tables 17** and **18** below. A comparison of Alternatives is contained in **Section 3.3.7**. Table 18 shows that on NFS land, a constructed road crossing on 2 intermittent streams are anticipated. These would occur on intermittent drainages #19 and #20. The stream crossings would not occur on soils that have a severe hazard rating. Areas of soils with a severe hazard rating are shown on **Figure 7**.

3.3.5.1 Construction

Table 17 Poeville Alternative Effects to Soils

Impact Indicator	USFS (acres)	All Land (acres)
Soils Permanently Lost	0.01	3.79
Soils Temporarily Disturbed		
Line Clearance (forested vegetation community)	0	0
Pole Structure Installation	30.73	107.61
Wire Pulling	130	416
Construction Staging	0	22.8
Centerline Travel Road	0	19.6
Road Widening (outside of the variable width corridor)	6.87	61.52

Table 18 Poeville Alternative Effects to Other Watershed Resources

Impact Indicator	USFS			All Land		
	ROW	Variable Width Corridor	Road Widening	ROW	Variable Width Corridor	Road Widening
Soils Rated Severe Erosion Hazard (acres)	20.6	111.8	6.7	106.4	629.8	43.5
Streams within Soils Rated Severe Erosion Hazard (quantity)	2	2	0	5	5	1
Road Crossings within Soils Rated Severe Erosion Hazard (quantity)	0	0	0	9	9	6
Wetland/Riparian Road Crossings (quantity)	2	2	0	6	6	3

3.3.5.2 Operation and Maintenance

Impacts from the operation and maintenance of the Poeville Alternative would be less than those posed by construction activities (**Tables 13** and **14**). Episodes of maintenance would be infrequent and less intensive due to the shorter duration of maintenance activities and the use of fewer equipment and vehicles.

3.3.6 Peavine/Poeville Alternative

Project impacts for the Peavine/Poeville Alternative are presented in **Tables 19** and **20** below. A comparison of Alternatives is contained in **Section 3.3.7**. Areas of soils with a severe hazard rating are shown on **Figure 8**.

3.3.6.1 Construction

Table 19 Peavine/Poeville Alternative Impacts to Soils

Impact Indicator	USFS (acres)	All Land (acres)
Soils Permanently Lost (poles and substation expansion)	0.03	3.85
Soils Temporarily Disturbed		
Line Clearance (forested vegetation community)	11.32	12.12
Pole Structure Installation	16.64	52.41
Wire Pulling	78	208
Construction Staging	0	22.8
Centerline Travel Road	15.6	28.4
Road Widening (outside of the variable width corridor)	22.65	66.36

Table 20 Peavine/Poeville Alternative Impacts to Other Watershed Resources

Impact Indicator	USFS			All Land		
	ROW	Variable Width Corridor	Road Widening	ROW	Variable Width Corridor	Road Widening
Soils Rated Severe Erosion Hazard (acres)	40.6	313.0	20.2	90.4	548.9	49.3
Streams within Soils Rated Severe Erosion Hazard (quantity)	9	9	5	10	10	9
Road Crossings within Soils Rated Severe Erosion Hazard (quantity)	7	7	4	8	8	8
Wetland/Riparian Road Crossings (quantity)	0	0	0	6	6	2

3.3.6.2 Operation and Maintenance

Impacts from the operation and maintenance of the Peavine/Poeville Alternative would be less than those posed by construction activities (**Tables 19** and **20**). Episodes of maintenance would be infrequent and less intensive due to the shorter duration of maintenance activities and the use of fewer equipment and vehicles.

3.3.7 Summary of Alternatives

Table 21 Summary Comparison of Alternatives

Impact Indicator	Mitchell	Peavine	Poeville	Peavine/Poeville
USFS				
Transmission Line (miles)	8.4	7.0	4.1	4.3
Permanent Loss of Substrate (acres)	0.07	0.06	0.01	0.03
Temporary Soil Disturbance (acres) (not including line clearance area)	176.5	204.1	167.6	132.9
Line Clearance Area	42.11	21.09	0	11.32

Impact Indicator	Mitchell	Peavine	Poeville	Peavine/Poeville
(acres of forested vegetation, including aspen)				
Soils Rated Severe Erosion Hazard (acres)	701.2	597.9	139.1	379.8
Streams within Soils Rated Severe Erosion Hazard (quantity)	11	15	0	13
Streams Crossings within Soils Rated Severe Erosion Hazard (quantity)	7	12	0	10
Wetland/Riparian Crossings (quantity)	0	0	2	0
BLM				
Transmission Line (miles)	0.4	0.4	0.4	0.4
Permanent Loss of Substrate (acres)	3.71	3.71	3.71	3.71
Temporary Soil Disturbance (acres)	30.6	30.6	30.6	30.6
Soils Rated Severe Erosion Hazard (acres)	0	0	0	0
All Land				
Transmission Line (miles)	11.7	10.3	18.0	11.9
Permanent Loss of Substrate (acres)	3.80	3.79	3.87	3.85
Temporary Soil Disturbance (acres) (not including line clearance area)	281.7	302.1	627.53	367.8
Line Clearance Area (acres of forested vegetation, including aspen)	42.11	21.09	0	12.12
Soils Rated Severe Erosion Hazard (acres)	772.4	684.1	779.7	688.6
Streams within Soils Rated Severe Erosion Hazard (quantity)	13	19	15	18
Streams Crossings within Soils Rated Severe Erosion Hazard (quantity)	9	16	15	15
Wetland/Riparian Road Crossings (quantity)	2	7	11	8

Table 21 shows that the Poeville Alternative has the fewest number of miles on NFS land and generally has fewest impacts to watershed resources. However, the acreage of temporary soil disturbance on NFS land for the Poeville Alternative is higher than the Peavine/Poeville Alternative. This is due to the alignment of the Poeville Alternative having more than turns where a wire pulling site would be needed. On NFS land, the Mitchell and Peavine Alternatives generally had the most impacts to watershed resources, and specifically, the Mitchell Alternative would have the most impacts from line clearance activities.

When considering both public and private land combined, the Peavine Alternative and Peavine/Poeville Alternatives generally had the fewest impacts. The Peavine has slightly fewer impacts than the Peavine/Poeville Alternative. The Poeville Alternative generally has the most

impacts, primarily because it was the longest alternative and has the greatest number of wire pulling and pole structure sites.

3.4 CUMULATIVE EFFECTS

The boundaries of the CIAA include the study area, areas within two miles of the centerline of each Action Alternative, and areas within two miles of the California and Bordertown substations (**Figure 9**). The CIAA includes all areas where road construction and road widening would occur. This area was selected as the CIAA rather than sub-watershed boundaries because the Action Alternatives would be unlikely to have any measureable incremental effects on watershed resources beyond two miles.

3.4.1 Past and Present Actions

The past and present actions considered in the cumulative impacts analysis for water and soil resources include roads, utility corridors, urban development and encroachment, mining, unauthorized OHV recreational use, wildland fire, post-fire reforestation, fuels management, and grazing. To provide an indicator of the magnitude that cumulative actions have had on watershed resources, the area of direct effects were compiled using GIS data obtained from the BLM and USFS or from interpretation of aerial imagery. For each action, the total amount of disturbance by watershed is also presented (**Table 22**).

Table 22 Estimated Area of Disturbance of Past and Present Actions in the CIAA

Cumulative Action	Action Area or Distance	Total Length of Stream or Quantity of Stream Crossings	Percent within the CIAA or subwatershed*
Historic Wildland Fires – 2000 to Present	*8,048 acres*		*13%*
Within Truckee River Watershed	7,102 acres	26.5 stream miles	24%
Within Eagle-Honey Lakes Watershed	946 acres	2.3 stream miles	3%
Grazing	*3,730 acres*		*6%*
Within Truckee River Watershed	570 acres	2.7 stream miles	2%
Within Eagle-Honey Lakes Watershed	3,160 acres	21 stream miles	9%
Urban Development	*3,010 acres*		*5%*
Within Truckee River Watershed	2,473 acres	11.4 stream miles	8%
Within Eagle-Honey Lakes Watershed	537 acres	0.1 stream miles	2%
Non-highway Roads and Trails	*1,178 acres* *486 miles*		*1%*
Within Truckee River Watershed	615 acres 254 miles	224 stream crossings	0.90%
Within Eagle-Honey Lakes Watershed	563 acres 232 miles	193 stream crossings	2%

Cumulative Action	Action Area or Distance	Total Length of Stream or Quantity of Stream Crossings	Percent within the CIAA or subwatershed*
Plantations – 1980 to Present	*629 acres*		*1%*
Within Truckee River Watershed	346 acres	1.4 stream miles	1%
Within Eagle-Honey Lakes Watershed	283 acres	0.4 stream miles	1%
Transmission Lines and Substations	*295 acre* *27 miles*		*1%*
Within Truckee River Watershed	134 acres 12 miles	16 stream crossings	<0.1%
Within Eagle-Honey Lakes Watershed	162 acres 15 miles	19 stream crossing	<0.1%
Buried Pipelines	*27 acres* *9.1 miles*	*13 stream crossings*	*<0.1%*
Within Truckee River Watershed	27 acres 9.1 miles	13 stream crossings	<0.1%
Within Eagle-Honey Lakes Watershed	0	0	0
Historic and Active Mines	*25 acres*		*<0.1%*
Within Truckee River Watershed	0	0	0
Within Eagle-Honey Lakes Watershed	25 acres	0.3 stream miles	<0.1%

* The CIAA contains 63,488 acres; area of the CIAA within the Truckee River Watershed is 29,800 acres; area of the CIAA within the Eagle-Honey Lakes Watershed us 33,688 acres.
Source: aerial photography

Wildland fire and urban development appear to have had the greatest area of disturbance within the Truckee River Watershed. In contrast, within the Eagle-Honey Lakes watershed, grazing appears to have had the greatest area of disturbance, and urban development within the Eagle-Honey Lakes Watershed has been minimal. Countering some but not all of the adverse effects, other cumulative actions that have improved or protected water and soil resources include reforestation after wildland fires (plantations).

3.4.2 Reasonably Foreseeable Actions

The reasonably foreseeable future actions that would be anticipated to have cumulative impacts on water and soil resources include:

- Wildland fires and livestock grazing (on private land).This action would occur within 2 miles of all Action Alternatives.

- Urban development east of Verdi within the Bull Ranch Creek-Truckee River subwatershed. The build-out of the Mortensen-Garson Overlay District includes areas surrounding Boomtown Casino and Cabela's. Current zoning allows for various

industrial, commercial and residential uses, most of which would occur south of the Truckee River. This action would occur within 2 miles of all Action Alternatives.

- Dog Valley Fuels Reduction and Ecosystem Enhancement Project, which would be implemented across 13,056-acres. The Dog Valley Fuels Reduction and Ecosystem Enhancement project consists of forest thinning and fuels treatment activities on 13,056-acres. This project would occur within 2 miles of the Mitchell Alternative, but would not affect other Action Alternatives.

3.4.3 Cumulative Effects of Action Alternatives

Despite the relatively large disturbances from past wildland fires and urban development, surface water quality is generally good in both watersheds for suspended sediment and turbidity (NDEP 2012) (Scorecard 2013). The current good condition indicates that effects from past and present actions to watershed resources were at least short-term. The current good condition of the watersheds indicates that the continuation of wildland fires and urban development (reasonable foreseeable) would have short-term impacts, but would not likely to worsen the existing conditions.

The Dog Valley Fuels Reduction and Ecosystem Enhancement Project includes project design features protecting watershed resources such as establishment of protective buffers around streams and prohibition of new stream crossings. As such, the Dog Valley Fuels Reduction and Ecosystem Enhancement Project would not have long-term impacts to watershed resources. Any impacts would be short-term and would not likely to worsen the existing watershed conditions.

The contribution of any Action Alternatives to cumulative effects would be minor because disturbances would be reclaimed and BMPs and design features would be implemented. Virtually all of the project's impacts would be short-term because very few acres of soil would be permanently lost (0.01 to 0.07 acres). Additionally, once an Action Alternative is selected, USFS would have the opportunity to review and approve NV Energy's COM Plan. This would ensure that cumulative effects to watershed resources are no more than minor because USFS's approval would consider whether Forest Plan management directives for the protection of soil, water, and riparian areas could be met. The cumulative impacts are considered the same for all Action Alternatives, as there are few differences on a watershed scale among alternatives.

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FIGURES

Bordertown Substation
Alturas Line
Silver Lake Substation
#141 Line
Peavine Peak
Poeville
CALIFORNIA
NEVADA
Summit One
#102 Line
Beacon Point
#101 Line
California Substation
Verdi
#106 Line
Somersett Community
#114 Line (Underground)
#114 Line
Northwest Substation
Reno
#142 Line
Mogul
Washoe Substation
North Valley Road Substation
#114 Line
#142 Line
Truckee River
Copyright © 2009 ESRI

Legend

Transmission Line Alternatives
- Mitchell
- Peavine
- Poeville
- Peavine/Poeville

Existing Features
- 120 kV Transmission Line
- Underground 120 kV Transmission Line
- 345 kV Transmission Line
- Substation
- USFS Roads
- USFS Trails

Land Ownership
- U.S. FOREST SERVICE
- PRIVATE LAND
- CALIFORNIA DEPT. OF FISH AND WILDLIFE
- U.S. BUREAU OF LAND MANAGEMENT
- U.S. DEPT. OF DEFENSE
- U.S. BUREAU OF RECLAMATION

Note: Segments of Transmission Line Alternatives that appear parallel share the same alignment. Transmission lines are offset for visual purposes only.

N

1" = 6,000 feet

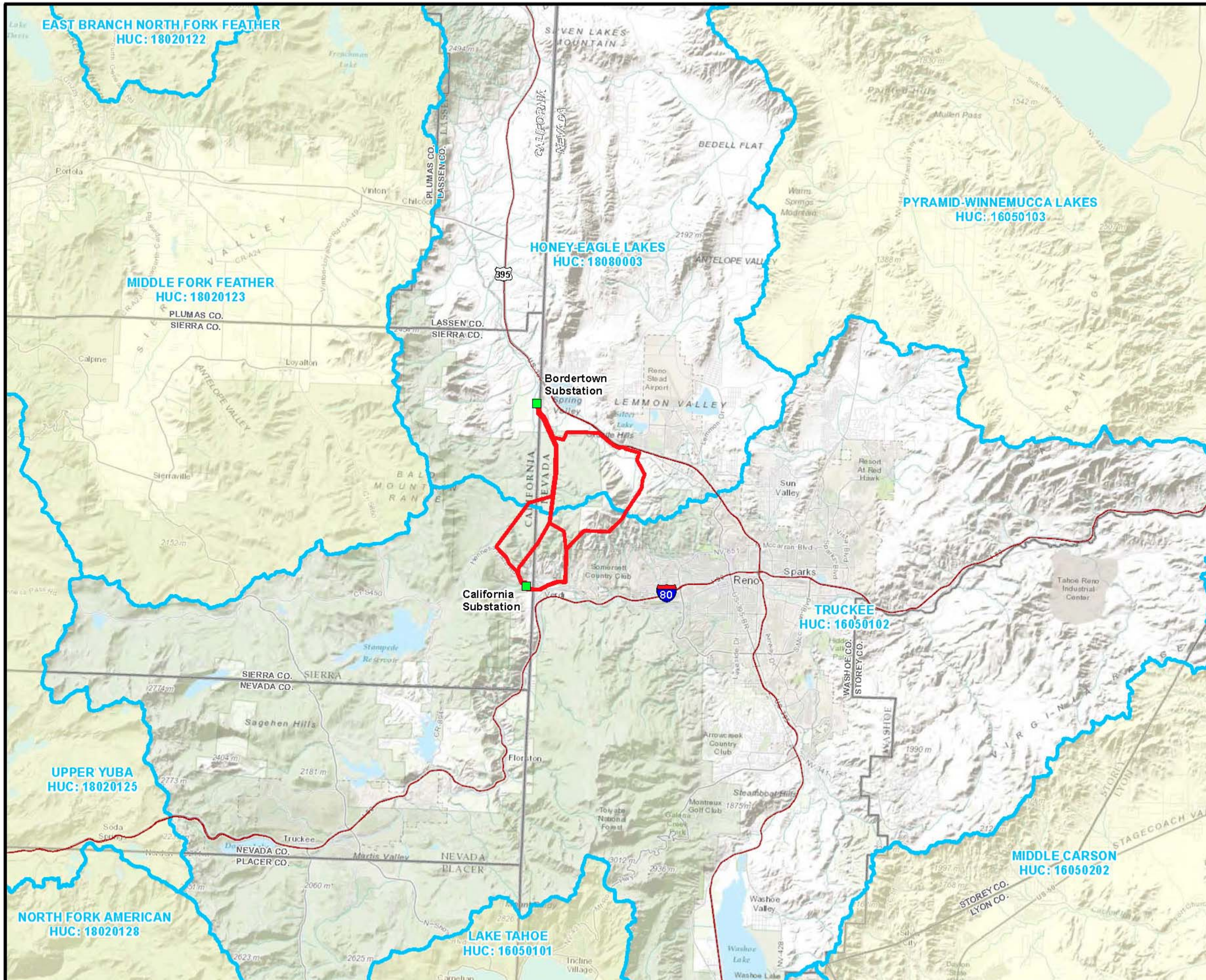
0 3,000 6,000 12,000 Feet

DATE DRAWN: 11/22/2013

SPECIALIST REPORT

BORDERTOWN TO CALIFORNIA
120 KV TRANSMISSION LINE PROJECT

FIGURE 1
OVERVIEW OF
ACTION ALTERNATIVES CONSIDERED



Legend

- Existing Substation
- Project and Alternatives
- USGS Hydrologic Units

Note: Proposed Action and Alternative transmission line segments that appear parallel share the same alignment. Transmission lines are offset for visual purposes only.

N

1" = 5 miles

0 2.5 5 10 Miles

DATE DRAWN: 11/25/2013

SPECIALIST REPORT
WATER AND SOIL

BORDERTOWN TO CALIFORNIA
120 KV TRANSMISSION LINE PROJECT

FIGURE 2
WATERSHEDS WITHIN THE STUDY AREA

Evans Canyon-Long Valley Creek 180800031202

Purdy Creek

Cold Spring Valley 180800030902

BORDERTOWN SUBSTATION

395

Lemmon Valley 180800030901

Headwaters Long Valley Creek 180800031201

Jones Creek

CALIFORNIA

NEVADA

Long Valley Creek

North Branch Dog Creek

Mitchell Canyon

Dog Creek 160501020503

Dog Creek

Brooklyn Creek

South Branch Dog Creek

Bull Ranch Creek

Hunter Creek-Truckee River 160501020505

Sunrise Creek

CALIFORNIA SUBSTATION

Bull Ranch Creek-Truckee River 160501020504

Colbron Creek

80

Truckee River

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Transmission Line Alternatives

- Mitchell
- Peavine
- Poeville
- Peavine/Poeville

- Public and Private Roads to be Widened Temporarily
- Stream
- Subwatershed Boundary
- USFS Boundary

N

1 inch = 5,000 feet

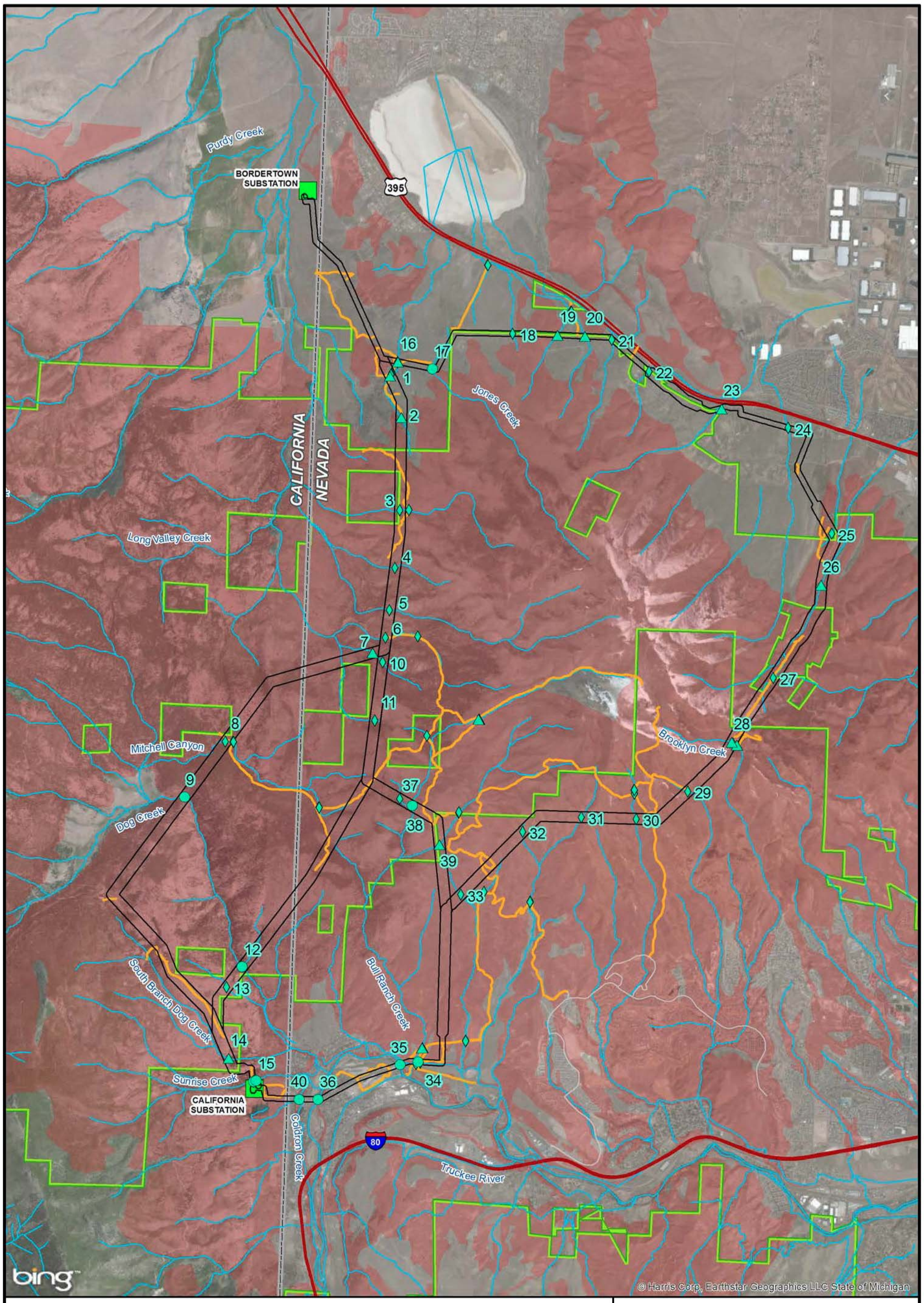
5,000 2,500 0 5,000 Feet

DATE DRAWN 11/27/2013

SPECIALIST REPORT WATER AND SOIL

BORDERTOWN TO CALIFORNIA 120 KV TRANSMISSION LINE PROJECT

FIGURE 3
SUBWATERSHEDS WITHIN THE PROJECT AREA



Variable Width Analysis Corridor

Soils with Severe Erosion Hazard

Stream Flow Regime

Ephemeral

Intermittent

Perennial

Public and Private Roads to be Widened Temporarily

Stream

USFS Boundary

N

1 inch = 5,000 feet

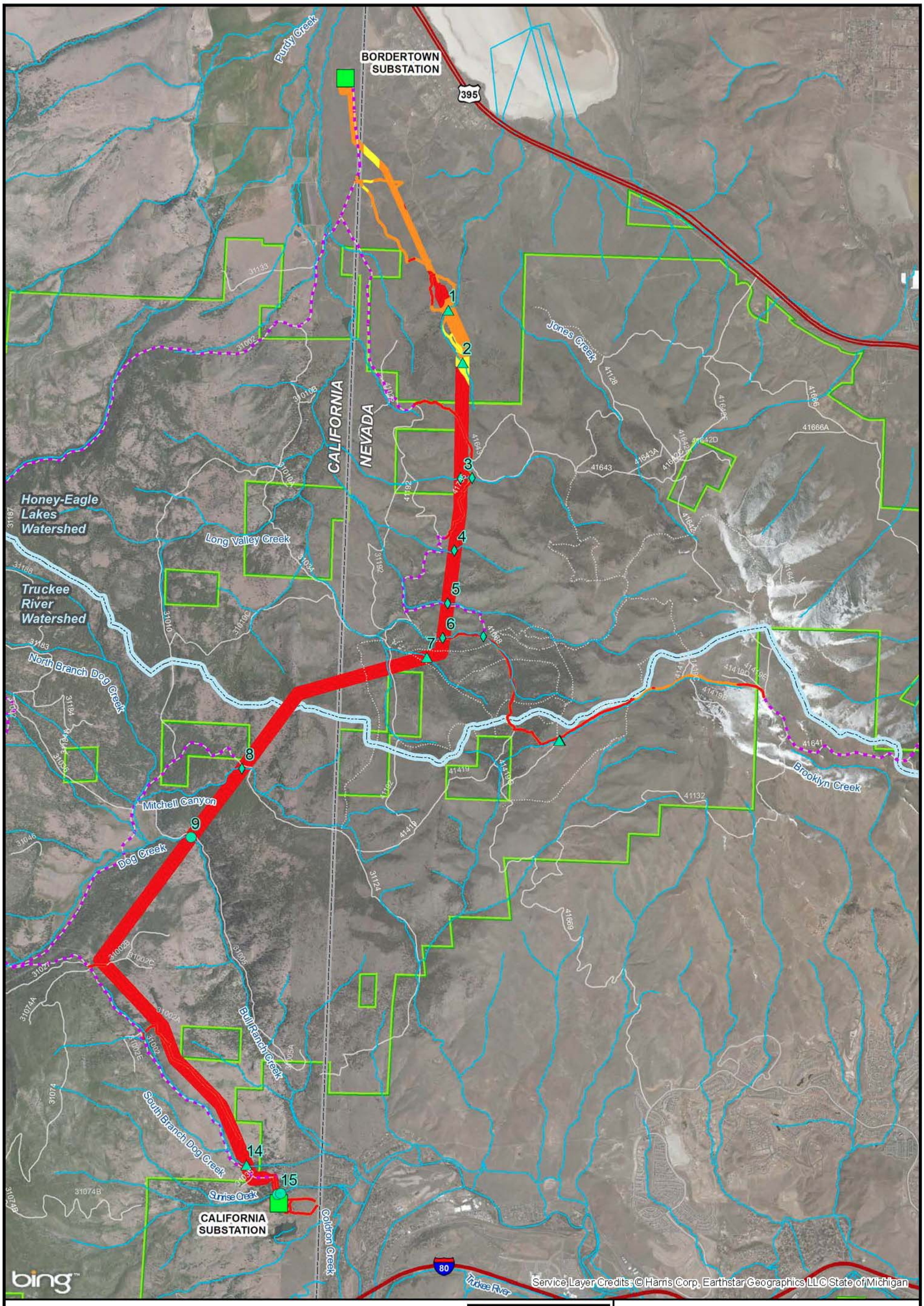
5,000 2,500 0 5,000 Feet

DATE DRAWN 11/22/2013

SPECIALIST REPORT
WATER AND SOIL

BORDERTOWN TO CALIFORNIA
120 KV TRANSMISSION LINE PROJECT

FIGURE 4
EROSION HAZARD OVERVIEW



Variable Width Analysis Corridor

Stream Flow Regime

- Ephemeral
- Intermittent
- Perennial

Erosion Hazard Rating

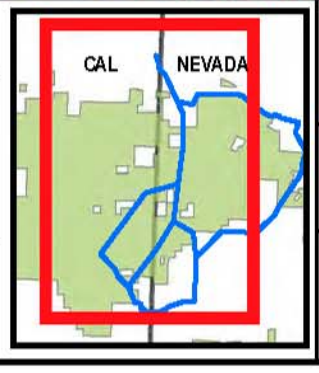
- Severe
- Moderate
- Slight

- Existing Public and Private Roads to be Used (No Widening)
- Public and Private Roads to be Widened Temporarily
- Stream
- USFS Boundary

1 inch = 4,000 feet

4,000 2,000 0 4,000 Feet

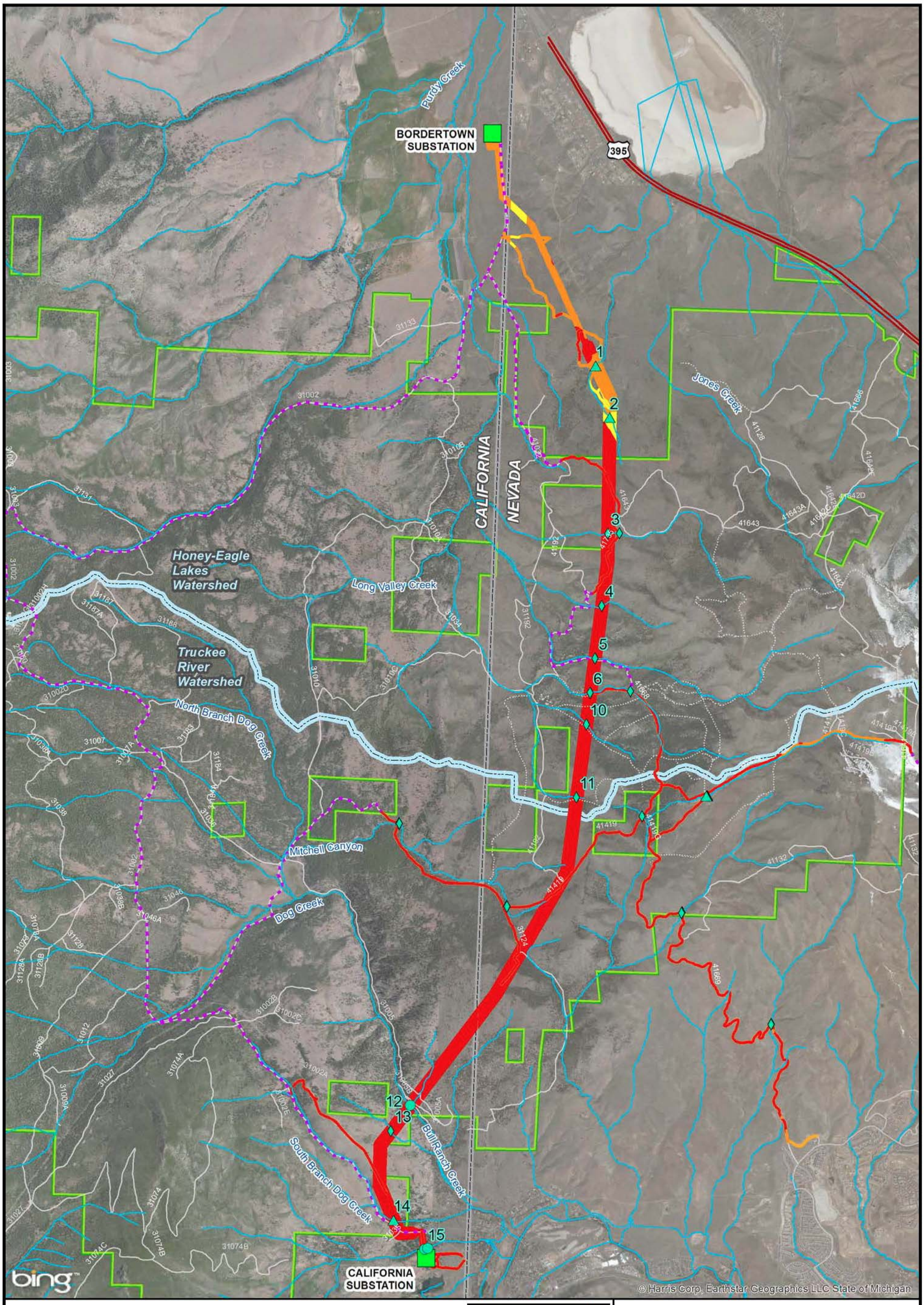
DATE DRAWN 11/25/2013



SPECIALIST REPORT WATER AND SOIL

BORDERTOWN TO CALIFORNIA
120 KV TRANSMISSION LINE PROJECT

FIGURE 5
EROSION HAZARD
MITCHELL ALTERNATIVE



Variable Width Analysis Corridor

Stream Flow Regime

- Ephemeral
- Intermittent
- Perennial

Erosion Hazard Rating

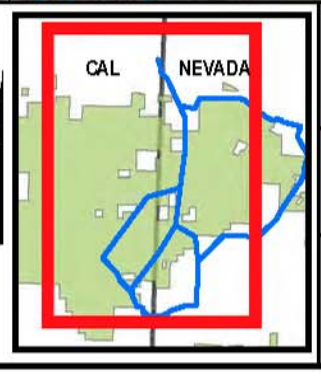
- Severe
- Moderate
- Slight

- Existing Public and Private Roads to be Used (No Widening)
- Public and Private Roads to be Widened Temporarily
- Stream
- USFS Boundary

1 inch = 4,000 feet

4,000 2,000 0 4,000 Feet

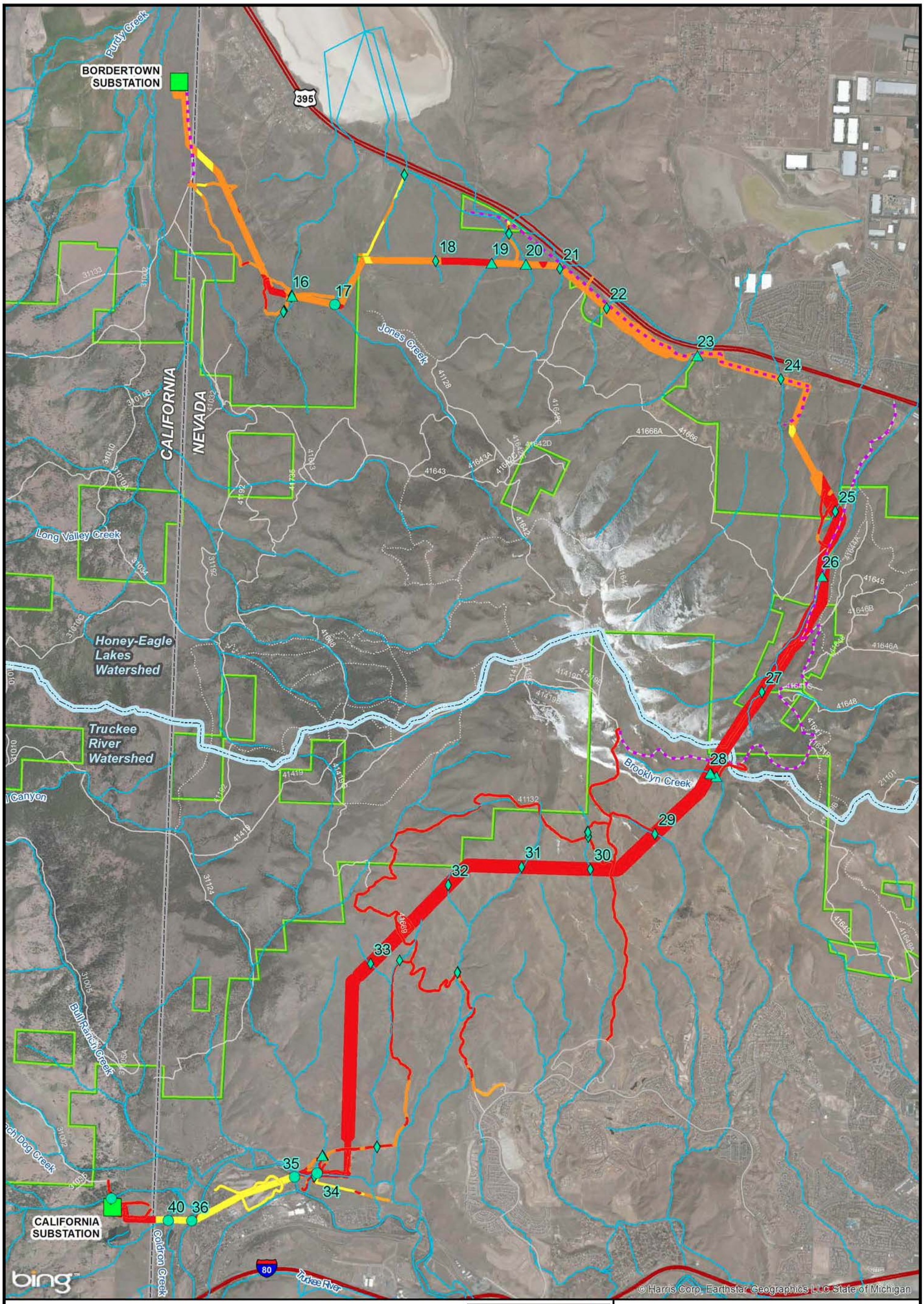
DATE DRAWN 11/25/2013



SPECIALIST REPORT WATER AND SOIL

BORDERTOWN TO CALIFORNIA
120 KV TRANSMISSION LINE PROJECT

FIGURE 6
EROSION HAZARD
PEAVINE ALTERNATIVE



Variable Width Analysis Corridor

Stream Flow Regime

- Ephemeral
- Intermittent
- Perennial

Erosion Hazard Rating

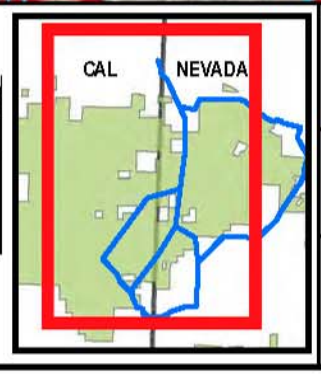
- Severe
- Moderate
- Slight

- Existing Public and Private Roads to be Used (No Widening)
- Public and Private Roads to be Widened Temporarily
- Stream
- USFS Boundary

1 inch = 4,000 feet

4,000 2,000 0 4,000 Feet

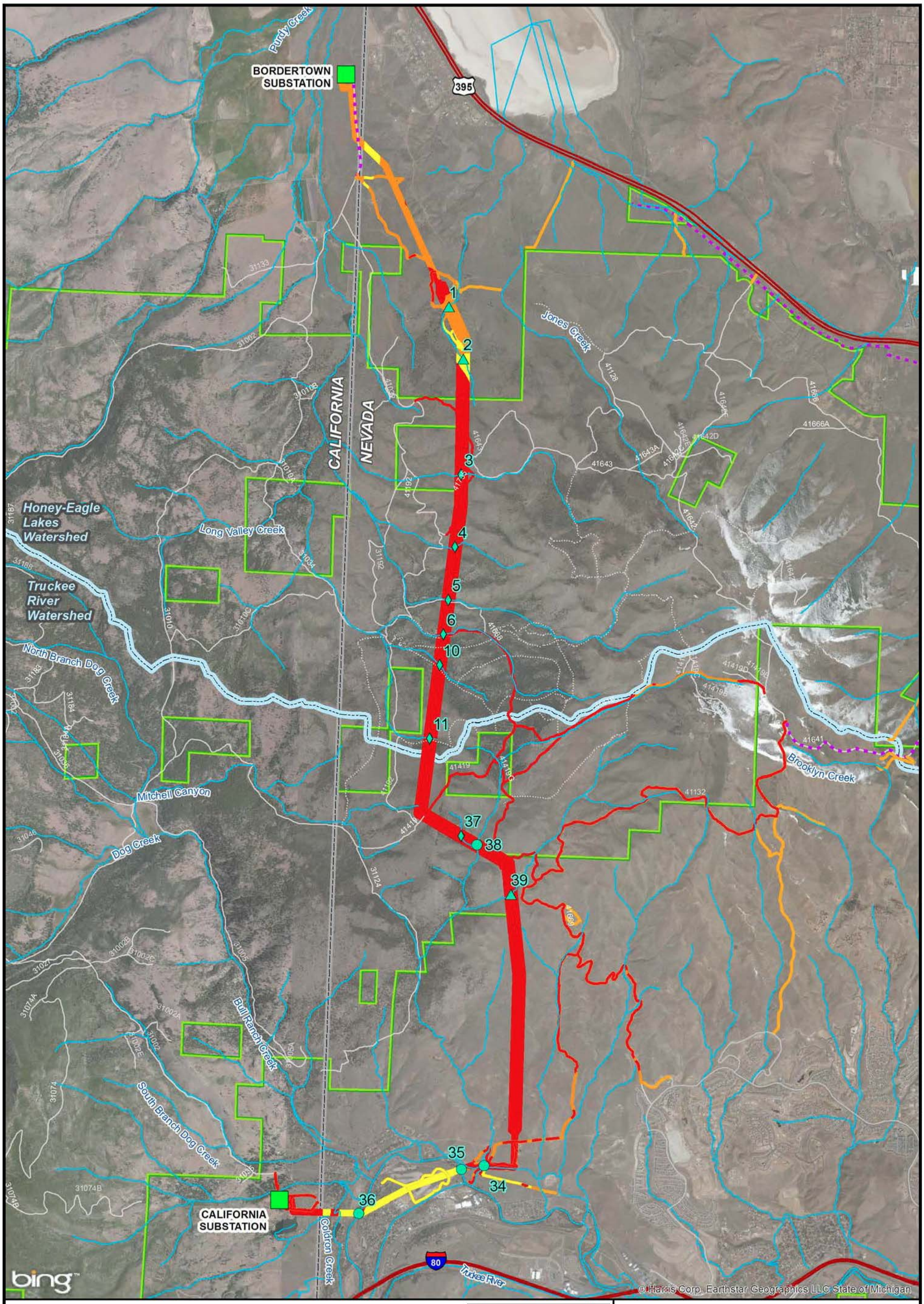
DATE DRAWN 11/25/2013



SPECIALIST REPORT
WATER AND SOIL

BORDERTOWN TO CALIFORNIA
120 KV TRANSMISSION LINE PROJECT

FIGURE 7
EROSION HAZARD
POEVILLE ALTERNATIVE



Variable Width Analysis Corridor

Stream Flow Regime

- Ephemeral
- Intermittent
- Perennial

Erosion Hazard Rating

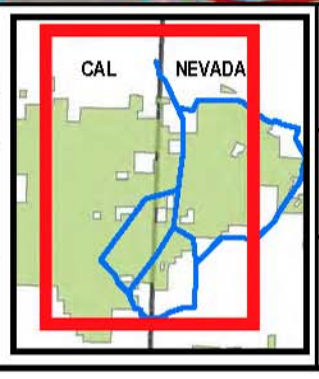
- Severe
- Moderate
- Slight

- Existing Public and Private Roads to be Used (No Widening)
- Public and Private Roads to be Widened Temporarily
- Stream
- USFS Boundary

1 inch = 4,000 feet

4,000 2,000 0 4,000 Feet

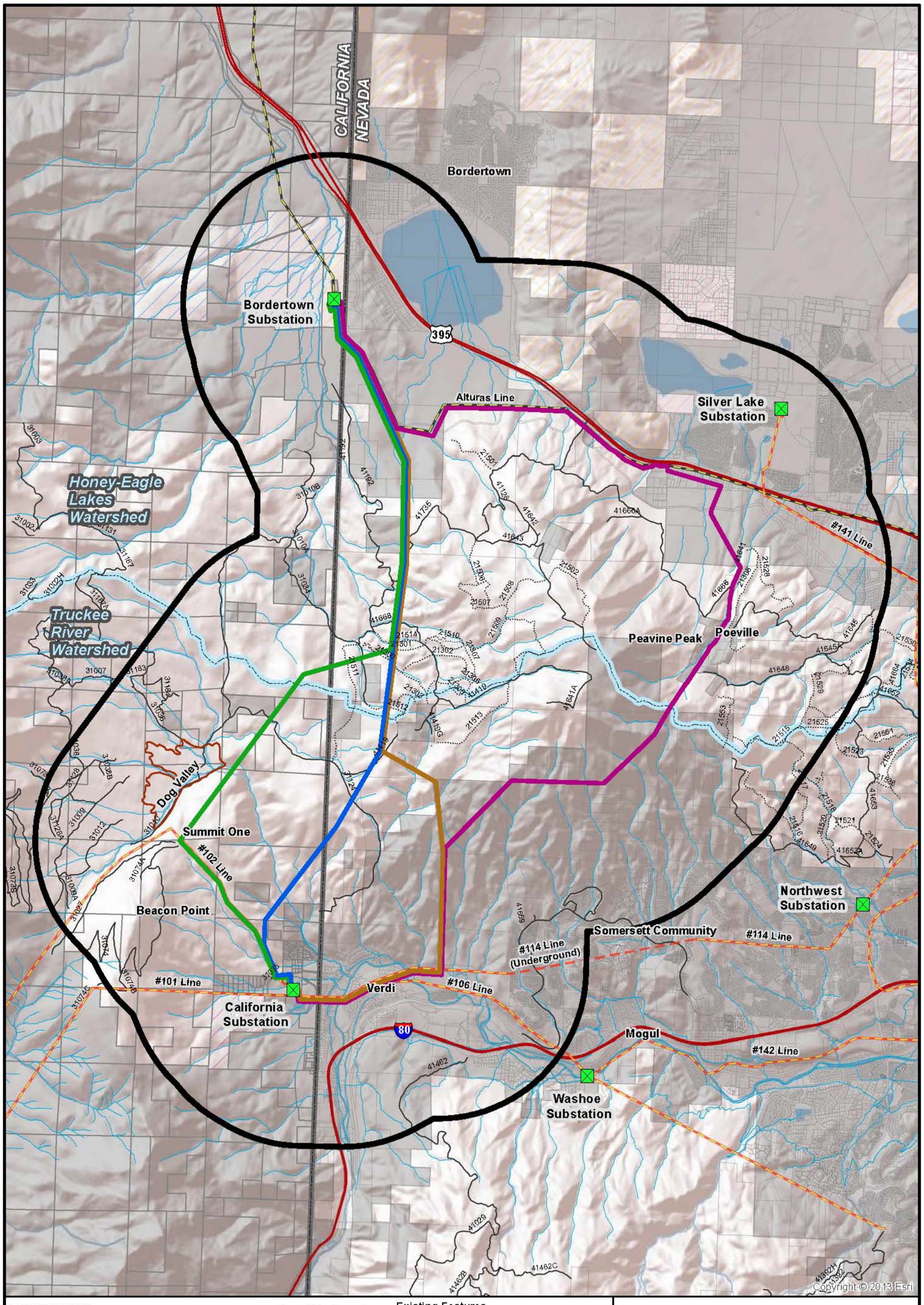
DATE DRAWN 11/25/2013



SPECIALIST REPORT WATER AND SOIL

BORDERTOWN TO CALIFORNIA
120 KV TRANSMISSION LINE PROJECT

FIGURE 8
EROSION HAZARD
PEAVINE/POEVILLE ALTERNATIVE



SPECIALIST REPORT
WATER AND SOIL

BORDERTOWN TO CALIFORNIA
120 KV TRANSMISSION LINE PROJECT

FIGURE 9
CUMULATIVE IMPACTS ANALYSIS AREA

APPENDIX A

Waters of the United States

Definition of Waters of the United States

Streams and wetlands are generally considered waters of the United States and are defined in both USACE and USEPA regulations, 33 CFR Part 328.3 and 40 CFR Part 230.3 However, Supreme Court decisions in 2001 and 2008 removed certain types of waters from federal protection. In light of the court rulings, the current legal guidance issued by USACE and USEPA consider the following types of streams and wetlands as a water of the United States (EPA 2008):

- Interstate waters;
- Traditional navigable waters;
- Wetlands adjacent to traditional navigable waters;
- Non-navigable tributaries of traditional navigable waters that are relatively permanent;
- (i.e., the tributaries typically flow year-round or have continuous flow at least seasonally); and
- Wetlands that directly abut such tributaries.

The following types of streams and wetlands would be considered as a water of the United States if they had a significant nexus with a traditional navigable water (TNW):

- Non-navigable tributaries that do not typically flow year-round or have continuous flow at least seasonally;
- Wetlands adjacent to such tributaries; and
- Wetlands adjacent to but that do not directly abut a relatively permanent non-navigable tributary.

The USACE and USEPA Guidance (USEPA 2008) explains that, "a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or an insubstantial effect on the chemical, physical, and/or biological integrity of a TNW. Factors that should be considered include volume, duration, and frequency of flow; proximity of the tributary to a TNW; and hydrologic, ecologic, and other functions performed by the tributary and its adjacent wetlands."

Isolated streams and wetlands that have no connection to interstate commerce or connection to a TNW are not considered a water of the United States. This is based on a 2001 Supreme Court ruling in the Solid Waste Agency of Northern Cook County (SWANCC) case. The Supreme Court ruled that aquatic features (e.g., wetlands and stream channels) that lack a tributary connection to a jurisdictional water body and lack any connection to interstate commerce would not be considered waters of the United States and not subject to CWA 404 jurisdiction.

Preliminary Jurisdictional Determination

Streams and wetlands within the project area were evaluated to determine whether the stream would be considered a water of the United States, subject to regulation under the CWA. Based on the definition of a water of the United States and current legal guidance described in **Section 2.4.1**, streams and their adjacent wetlands that flow into the Truckee River and stream reaches that cross the California/Nevada state line would be considered a water of the United States (**Table A-1**).

Table A-1 Preliminary Jurisdictional Determination

Stream Name	Stream #	Sub-Watershed	Land Status	Alternative	Waters of the U.S. Determination Rationale
Truckee River Watershed					
Sunrise Creek	15	Bull Ranch Creek	Private	Mitchell Peavine	Yes; Interstate Water; Relatively permanent tributary of the Truckee River.
Unnamed Stream	33	Bull Ranch Creek	Private	Poeville	Yes; Hydrological and ecological significant nexus to the Truckee River.
Bull Ranch Creek	34	Bull Ranch Creek	Private	Poeville Peavine/Poeville	Yes; Relatively permanent tributary of the Truckee River.
Truckee River	35, 36	Bull Ranch Creek	Private	Poeville Peavine/Poeville	Yes; Traditional Navigable Water.
Unnamed Stream	37	Bull Ranch Creek	USFS	Peavine/Poeville	Yes; Hydrological and ecological significant nexus to the Truckee River.
Bull Ranch Creek	38	Bull Ranch Creek	USFS	Peavine/Poeville	Yes; Hydrological and ecological significant nexus to the Truckee River.
Unnamed Stream	39	Bull Ranch Creek	Private	Peavine/Poeville	Yes; Hydrological and ecological significant nexus to the Truckee River.
Unnamed Stream	40	Bull Ranch Creek	Private	Poeville Peavine/Poeville	Yes; Relatively permanent tributary of the Truckee River.
Mitchell Canyon	8	Dog Creek	USFS	Mitchell	Yes; Hydrological and ecological significant nexus to the Truckee River.
Dog Creek	9	Dog Creek	USFS	Mitchell	Yes, Interstate Water.
Dog Creek	12	Dog Creek	USFS	Peavine	Yes; Interstate Water; Relatively permanent tributary of the Truckee River.
Unnamed Stream	13	Dog Creek	USFS	Peavine	Yes; Hydrological and ecological significant nexus to the Truckee River.
South Branch Dog Creek	14	Dog Creek	USFS	Mitchell Peavine	Yes; Interstate Water; Relatively permanent tributary of the Truckee River.
Brooklyn Creek	28	Hunter Creek	Private	Poeville	Yes; Hydrological and ecological significant nexus to the Truckee River.
Unnamed Stream	29, 30, 31, 32	Hunter Creek	Private	Poeville	Yes; Hydrological and ecological significant nexus to the Truckee River.

Stream Name	Stream #	Sub-Watershed	Land Status	Alternative	Waters of the U.S. Determination Rationale
Eagle-Honey Lakes Watershed					
Unnamed Stream	3-6	Long Valley Creek	USFS	Mitchell Peavine Peavine/Poeville	Yes; Interstate Water.
Unnamed Stream	7	Long Valley Creek	USFS	Mitchell	Yes; Interstate Water.
Unnamed Stream	10, 11	Long Valley Creek	USFS	Peavine Peavine/Poeville	Yes; Interstate Water.
Unnamed Stream	1, 2	Cold Spring Valley	Private	Peavine Peavine/Poeville	No; Isolated with No Interstate Commerce Use.
Unnamed Stream	16, 18-20	Cold Spring Valley	Private	Poeville	No; Isolated with No Interstate Commerce Use.
Jones Creek	17	Cold Spring Valley	Private	Poeville	No; Isolated with No Interstate Commerce Use.
Unnamed Stream	21	Cold Spring Valley	USFS	Poeville	No; Isolated with No Interstate Commerce Use.
Unnamed Stream	22-27	Lemmon Valley	Private	Poeville	No; Isolated with No Interstate Commerce Use.

The Truckee River through the project area has been designated by the USACE as TNW. Therefore, the Truckee River and all tributaries that flow for at least three months out of the year (e.g., Bull Ranch Creek, Sunrise Creek, Dog Creek) would meet the criteria as a water of the United States. Within the Dog Creek, Bull Ranch Creek, and Hunter Creek sub-watersheds, it is probable that all intermittent and ephemeral tributaries that flow for less than three months out of the year would likely be jurisdictional based on a significant nexus to the Truckee River. The proximity of these streams to the Truckee River makes it likely that discharge of sediment in these streams could have a measureable effect on the Truckee River.

Within the Long Valley Creek sub-watershed, streams that cross the project area would meet the criteria of a water of the United States because they also cross the California/Nevada state line. Streams within Lemmon Valley and Cold Springs sub-watersheds would not qualify as a water of the United States because they are isolated and do not have a tributary connection to a jurisdictional feature.

No formal coordination with the USACE was conducted, and therefore, the determination of jurisdictional status should be considered preliminary until verified by the USACE.

References

United States Environmental Protection Agency and United States Department of the Army (USEPA). 2008. *Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States*. 13pp. April 2008. Available online at: http://www.usace.army.mil/CECW/Pages/cwa_guide.aspx

APPENDIX B

Soil Units Found in the Soils Analysis Area

Table B-1 Soil Units within the ROW

Soil Unit and Land Status	Mitchell	Peavine	Poeville	Peavine/ Poeville
BLM	**4.3**	**4.3**	**4.3**	**4.3**
Trosi very stony sandy loam, 2 to 15 percent slopes	4.3	4.3	4.4	4.3
Private	**31.5**	**31.5**	**148.3**	**78.6**
Apmat very stony coarse sand, 2 to 8 percent slopes	1.5	1.5		1.5
Badenaugh-Martineck-Dotta association, 2 to 30 percent slopes	3.9	3.9	1.2	1.2
Barnard-Trosi association	2.0	2.0	2.0	2.0
Burnborough-Ticino-Gabica association			5.8	
Burnborough-Ticino-Softscrabble association			1.2	
Cassiro gravelly sandy loam, 4 to 8 percent slopes	7.0	7.0	21.1	7.0
Cassiro gravelly sandy loam, 8 to 15 percent slopes	3.4	3.4	9.1	3.4
Dressler loamy sand, 2 to 4 percent slopes			2.1	2.1
Flex very gravelly sandy loam, 30 to 50 percent slopes			4.9	4.9
Fraval-Booford-Jumbo association	5.0	5.0	1.6	5.0
Galeppi sandy loam, 15 to 30 percent slopes			2.4	2.4
Graufels-Glenbrook-Haypress association			19.0	6.8
Haypress-Tanob-Rock outcrop complex, 15 to 50 percent slopes			6.3	
Haypress-Toiyabe complex, 2 to 30 percent slopes			4.1	4.1
Indiano gravelly loam, warm, 15 to 30 percent slopes			3.2	
Indiano-Koontz-Flex association			22.3	8.3
Koontz gravelly loam, 8 to 15 percent slopes	5.7	5.7	5.0	5.7
Koontz stony loam, 15 to 30 percent slopes	0.3	0.3	2.1	1.1
Northmore sandy loam, 4 to 8 percent slopes			4.6	
Notus stony loamy fine sand			0.3	0.3
Oest bouldery sandy loam, 2 to 8 percent slopes			1.7	1.7
Oest extremely stony sandy loam, 2 to 8 percent slopes			4.8	
Oest very bouldery sandy loam, 2 to 8 percent slopes			6.7	6.7
Oest very bouldery sandy loam, 30 to 50 percent slopes			1.3	1.3
Oppio cobbly sandy loam, 15 to 30 percent slopes			2.2	2.2
Orr stony sandy loam, gravelly substratum, 2 to 4 percent slopes			0.7	0.7
Settlemeyer gravelly loam, 2 to 4 percent slopes	0.2	0.2	0.8	0.2
Softscrabble-Gabica-Burnborough association			4.6	2.8
Springmeyer stony loam, 0 to 2 percent slopes			0.7	0.7
Stodick stony loam, 30 to 50 percent slopes			3.6	3.6
TrosiI very stony sandy loam, 2 to 15 percent slopes	2.5	2.5	2.5	2.5
Waspo gravelly clay, 2 to 8 percent slopes			0.1	0.1
Water			0.5	0.5
USFS	**91.2**	**76.5**	**44.2**	**46.6**
Aldi-Kyburz complex, 2 to 30 percent slopes	2.9			
Aldi-Kyburz-Rock outcrop complex, 30 to 75 percent slopes	13.1	4.7		
Badenaugh-Martineck-Dotta association, 2 to 30 percent slopes	0.7	0.7		

Soil Unit and Land Status	Mitchell	Peavine	Poeville	Peavine/ Poeville
Barshaad-Fugawee-Duckhill variant association	6.5	27.2		14.9
Burnborough-Ticino-Softscrabble association			6.9	
Cassiro gravelly sandy loam, 4 to 8 percent slopes			10.9	
Cassiro gravelly sandy loam, 8 to 15 percent slopes			4.4	
Franktown-Aldi-Rock outcrop complex, 2 to 30 percent slopes	1.9			
Franktown-Aldi-Rock outcrop complex, 30 to 50 percent slopes	5.4	9.1		
Fraval-Booford-Jumbo association	10.1	10.1		10.1
Indiano gravelly loam, warm, 15 to 30 percent slopes			7.4	
Indiano-Koontz-Flex association			1.2	
Koontz stony loam, 15 to 30 percent slopes			4.6	
Kyburz-Aldi complex, 2 to 30 percent slopes	9.8			
Kyburz-Aldi complex, 2 to 30 percent slopes, altered	3.3			
Kyburz-Aldi complex, 30 to 50 percent slopes	4.4			
Kyburz-Rock outcrop-Trojan complex, 2 to 30 percent slopes	1.7			
Kyburz-Rock outcrop-Trojan complex, 30 to 50 percent slopes	5.1			
Kyburz-Rock outcrop-Trojan complex, 30 to 50 percent slopes, eroded	5.9			
Kyburz-Trojan complex, 9 to 30 percent slopes	1.3			
Northmore sandy loam, 8 to 15 percent slopes			0.5	
Oest extremely stony sandy loam, 2 to 8 percent slopes			1.3	
Oest very gravelly loam, 8 to 15 percent slopes			0.1	
Old Camp stony sandy loam, 8 to 15 percent slopes			1.1	
Reno stony sandy loam, 2 to 8 percent slopes			1.1	
Rock outcrop-Franktown-Kyburz complex, 50 to 75 percent slopes		1.7		
Rouen variant-Aspen variant-Sierraville complex, 20 to 50 percent slopes	0.9			
Rouen variant-Aspen variant-Sierraville complex, 30 to 50 percent slopes	2.9	2.2		
Settlemeyer gravelly loam, 2 to 4 percent slopes			0.6	
Softscrabble-Gabica-Burnborough association				4.1
Toiyabe-Corbett-Haypress association	15.3	15.6		17.6
Toiyabe-Rock outcrop-Haypress complex, 30 to 75 percent slopes, severely eroded		5.3		
Verdico very stony sandy loam, 4 to 8 percent slopes			4.1	
Grand Total	**127.1**	**112.4**	**196.8**	**129.6**

Source: Natural Resources Conservation Service Soil Survey Geographic (SSURGO) dataset

Table B-2 Soil Units within the Variable Width Corridor

Soil Unit and Land Status	Mitchell	Peavine	Poeville	Peavine/ Poeville
BLM	**15.1**	**15.1**	**15.1**	**14.3**
Trosi very stony sandy loam, 2 to 15 percent slopes	15.1	15.1	15.1	14.3
Private	**155.4**	**158.3**	**753.2**	**376.6**
Aldi-Kyburz complex, 2 to 30 percent slopes	0.5			
Aldi-Kyburz-Rock outcrop complex, 30 to 75 percent slopes	0.7	1.7		
Apmat very stony coarse sand, 2 to 8 percent slopes	10.7	10.7		10.7
Badenaugh-Martineck-Dotta association, 2 to 30 percent slopes	16.8	16.8	5.3	5.3
Barnard-Trosi association	6.6	6.6	6.6	6.6
Barshaad-Fugawee-Duckhill variant association	0.3			
Burnborough-Ticino-Gabica association			39.2	
Burnborough-Ticino-Softscrabble association			14.5	
Cassiro gravelly sandy loam, 4 to 8 percent slopes	37.2	37.2	88.4	37.2
Cassiro gravelly sandy loam, 8 to 15 percent slopes	10.9	10.9	34.7	10.9
Dressler loamy sand, 2 to 4 percent slopes			6.6	6.6
Flex very gravelly sandy loam, 30 to 50 percent slopes			26.4	26.4
Franktown-Aldi-Rock outcrop complex, 30 to 50 percent slopes		2.7		
Fraval-Booford-Jumbo association	34.4	34.4	4.4	34.4
Galeppi sandy loam, 15 to 30 percent slopes			9.4	9.4
Graufels-Glenbrook-Haypress association			122.1	36.1
Haypress-Tanob-Rock outcrop complex, 15 to 50 percent slopes			48.1	
Haypress-Toiyabe complex, 2 to 30 percent slopes	0.4	0.4	13.0	13.0
Indiano gravelly loam, warm, 15 to 30 percent slopes			18.8	
Indiano-Koontz-Flex association			142.8	59.1
Koontz gravelly loam, 8 to 15 percent slopes	21.5	21.5	17.3	21.5
Koontz stony loam, 15 to 30 percent slopes	4.2	4.2	15.1	11.0
Kyburz-Aldi complex, 2 to 30 percent slopes	<0.1			
Lemm very gravelly coarse sandy loam, 4 to 8 percent slopes			1.2	
Leviathan stony sandy loam, 2 to 8 percent slopes			0.3	0.3
Northmore sandy loam, 4 to 8 percent slopes			14.5	
Northmore sandy loam, 8 to 15 percent slopes			0.3	
Notus stony loamy fine sand			0.9	0.9
Oest bouldery sandy loam, 2 to 8 percent slopes			7.2	7.2
Oest extremely stony sandy loam, 2 to 8 percent slopes			15.6	
Oest very bouldery sandy loam, 2 to 8 percent slopes			21.2	21.2
Oest very bouldery sandy loam, 30 to 50 percent slopes			4.1	4.1
Old Camp stony sandy loam, 8 to 15 percent slopes			0.3	
Oppio cobbly sandy loam, 15 to 30 percent slopes			12.8	12.8
Orr stony sandy loam, 4 to 8 percent slopes			0.3	0.3
Orr stony sandy loam, gravelly substratum, 2 to 4 percent slopes			2.3	2.3

Soil Unit and Land Status	Mitchell	Peavine	Poeville	Peavine/ Poeville
Reno stony sandy loam, 2 to 8 percent slopes			0.9	
Rock outcrop-Franktown-Kyburz complex, 50 to 75 percent slopes		<0.1		
Settlemeyer gravelly loam, 2 to 4 percent slopes	2.6	2.6	2.7	2.6
Softscrabble-Gabica-Burnborough association			29.2	11.7
Springmeyer stony loam, 0 to 2 percent slopes			1.9	1.9
Springmeyer stony loam, 2 to 4 percent slopes			0.1	0.1
Stodick stony loam, 30 to 50 percent slopes			12.4	12.4
Stodick very stony loam, 15 to 30 percent slopes	0.2	0.2	0.2	0.2
TrosiI very stony sandy loam, 2 to 15 percent slopes	8.4	8.4	8.4	8.4
Verdico very stony sandy loam, 4 to 8 percent slopes			1.8	
Waspo gravelly clay, 2 to 8 percent slopes			0.5	0.5
Water			1.6	1.6
USFS	**595.4**	**495.2**	**196.6**	**313.0**
Aldi variant-Kyburz-Jorge variant complex, 30 to 50 percent slopes		0.6		
Aldi-Kyburz complex, 2 to 30 percent slopes	17.1			
Aldi-Kyburz-Rock outcrop complex, 30 to 75 percent slopes	87.4	28.4		
Apmat very stony coarse sand, 2 to 8 percent slopes	<0.1	<0.1		<0.1
Badenaugh-Martineck-Dotta association, 2 to 30 percent slopes	4.5	4.5		
Barshaad-Fugawee-Duckhill variant association	43.1	181.1		99.3
Burnborough-Ticino-Softscrabble association			41.9	
Cassiro gravelly sandy loam, 4 to 8 percent slopes			41.7	
Cassiro gravelly sandy loam, 8 to 15 percent slopes			18.7	
Flex very gravelly sandy loam, 30 to 50 percent slopes			0.7	
Franktown-Aldi-Rock outcrop complex, 2 to 30 percent slopes	12.6			
Franktown-Aldi-Rock outcrop complex, 30 to 50 percent slopes	34.6	59.3		
Fraval-Booford-Jumbo association	57.9	57.9		57.9
Graufels-Glenbrook-Haypress association				5.1
Indiano gravelly loam, warm, 15 to 30 percent slopes			49.4	
Indiano-Koontz-Flex association			6.6	
Koontz stony loam, 15 to 30 percent slopes			11.0	
Kyburz-Aldi complex, 2 to 30 percent slopes	61.5			
Kyburz-Aldi complex, 2 to 30 percent slopes, altered	22.9			
Kyburz-Aldi complex, 30 to 50 percent slopes	31.3			
Kyburz-Rock outcrop-Trojan complex, 2 to 30 percent slopes	11.0			
Kyburz-Rock outcrop-Trojan complex, 30 to 50 percent slopes	32.9			
Kyburz-Rock outcrop-Trojan complex, 30 to 50 percent slopes, ero ded	39.1			
Kyburz-Trojan complex, 9 to 30 percent slopes	7.5			
Northmore sandy loam, 8 to 15 percent slopes			1.3	
Oest extremely stony sandy loam, 2 to 8 percent slopes			4.3	
Oest very gravelly loam, 8 to 15 percent slopes			1.0	

Soil Unit and Land Status	Mitchell	Peavine	Poeville	Peavine/ Poeville
Old Camp stony sandy loam, 8 to 15 percent slopes			3.4	
Reno stony sandy loam, 2 to 8 percent slopes			2.7	
Rock outcrop-Franktown-Kyburz complex, 50 to 75 percent slopes		10.9		
Rouen variant-Aspen variant-Sierraville complex, 20 to 50 percent slopes	5.9			
Rouen variant-Aspen variant-Sierraville complex, 30 to 50 percent slopes	24.0	14.4		
Settlemeyer gravelly loam, 2 to 4 percent slopes			2.0	
Softscrabble-Gabica-Burnborough association			1.0	34.4
Toiyabe-Corbett-Haypress association	102.5	103.8		116.4
Toiyabe-Rock outcrop-Haypress complex, 30 to 75 percent slopes, severely eroded		34.4		
Verdico very stony sandy loam, 4 to 8 percent slopes			11.0	
Grand Total	**765.9**	**668.6**	**964.9**	**703.9**

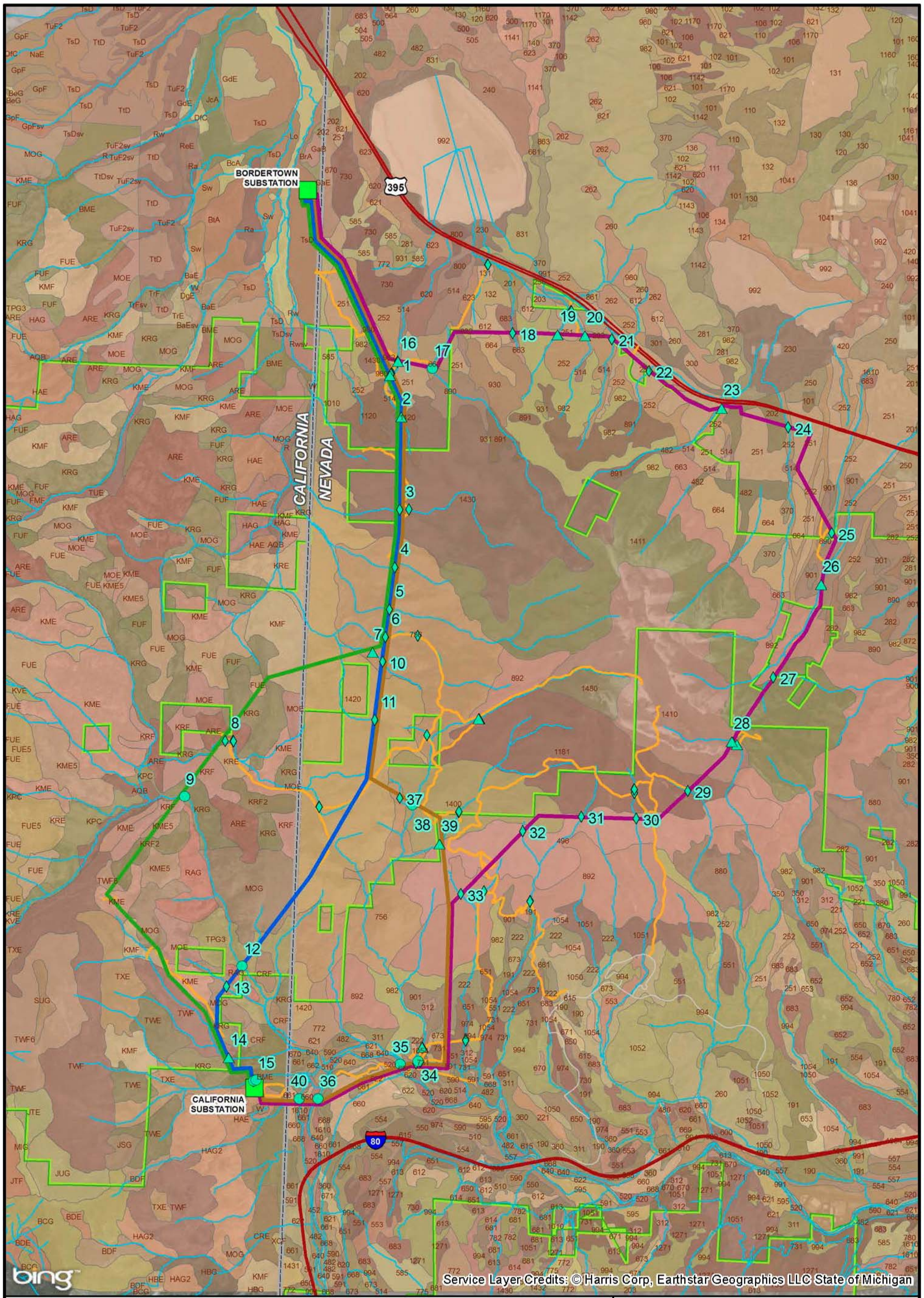
Source: Natural Resources Conservation Service Soil Survey Geographic (SSURGO) dataset

Table B-3 Soil Units within Road Widening Corridors

Soil Unit and Land Status	Mitchell	Peavine	Poeville	Peavine/ Poeville
BLM	**0**	**0**	**0**	**0**
Private	**11.1**	**23.7**	**54.3**	**43.5**
Aladshi gravelly sandy loam, 4 to 8 percent slopes			0.9	0.9
Aldi-Kyburz complex, 2 to 30 percent slopes		<0.1		
Apmat very stony coarse sand, 2 to 8 percent slopes	<0.1	<0.1		<0.1
Badenaugh-Martineck-Dotta association, 2 to 30 percent slopes	1.8	1.8	1.8	1.8
Badland-Chalco-Verdico complex, 8 to 30 percent slopes			0.3	0.3
Barnard-Trosi association	0.4	0.4	0.4	0.4
Barshaad-Fugawee-Duckhill variant association		1.0		1.0
Burnborough-Ticino-Gabica association	0.2	0.2	1.8	1.6
Burnborough-Ticino-Softscrabble association			1.2	
Cassiro gravelly sandy loam, 4 to 8 percent slopes	3.0	3.0	4.0	3.0
Cassiro gravelly sandy loam, 8 to 15 percent slopes	0.8	0.8	1.0	0.8
Chalco very stony clay loam, 30 to 50 percent slopes			0.9	0.9
Cradlebaugh loam			<0.1	
Dressler loamy sand, 2 to 4 percent slopes			0.1	0.1
Flex very gravelly sandy loam, 30 to 50 percent slopes		0.9	1.8	1.8
Fraval-Booford-Jumbo association	0.7	0.7	0.7	0.7
Galeppi sandy loam, 15 to 30 percent slopes			0.6	0.6
Graufels-Glenbrook-Haypress association		2.1	4.2	2.1
Greenbrae sandy loam, 0 to 2 percent slopes			0.6	
Greenbrae sandy loam, 2 to 4 percent slopes			0.5	
Haypress-Tanob-Rock outcrop complex, 15 to 50 percent slopes		0.1	5.9	3.4
Haypress-Toiyabe complex, 2 to 30 percent slopes	1.5	1.5	1.5	1.5
Holbrook cobbly loamy sand, 2 to 8 percent slopes			0.2	0.2
Indiano gravelly loam, warm, 15 to 30 percent slopes			0.9	
Indiano-Koontz-Flex association	<0.1	2.9	8.4	5.0
Koontz gravelly loam, 8 to 15 percent slopes	1.4	1.4	1.4	1.4
Koontz stony loam, 15 to 30 percent slopes	0.1	0.3	0.5	0.4
Leviathan stony sandy loam, 2 to 8 percent slopes			0.1	0.1
Manogue cobbly clay, 8 to 15 percent slopes		<0.1	0.4	0.4
Northmore sandy loam, 2 to 4 percent slopes			0.1	
Oest bouldery sandy loam, 2 to 8 percent slopes			1.5	1.5
Oest extremely stony sandy loam, 2 to 8 percent slopes			0.3	
Oest very bouldery sandy loam, 2 to 8 percent slopes			0.7	0.7
Oest very bouldery sandy loam, 30 to 50 percent slopes			0.5	0.5
Oppio cobbly sandy loam, 15 to 30 percent slopes		0.9	1.0	1.0
Orr sandy loam, 0 to 2 percent slopes			0.7	
Orr stony sandy loam, 4 to 8 percent slopes			<0.1	<0.1

Orr stony sandy loam, gravelly substratum, 2 to 4 percent slopes			0.8	0.8
Reno stony sandy loam, 2 to 8 percent slopes		0.4	0.4	0.4
Settlemeyer gravelly loam, 2 to 4 percent slopes	0.7	0.7	0.4	0.7
Softscrabble-Gabica-Burnborough association		1.2	1.2	2.2
Springmeyer stony loam, 0 to 2 percent slopes			0.8	0.8
Springmeyer stony loam, 2 to 4 percent slopes			0.2	0.2
Stodick stony loam, 30 to 50 percent slopes		0.3	2.2	2.2
Toiyabe-Corbett-Haypress association		1.9		1.9
Trosi very stony sandy loam, 2 to 15 percent slopes	4.3	4.3	4.4	4.3
Waspo clay, 15 to 30 percent slopes		0.5	0.8	0.5
Waspo gravelly clay, 2 to 8 percent slopes		0.3	1.6	1.6
Waspo stony clay, 30 to 50 percent slopes			0.7	
USFS	**17.1**	**29.0**	**7.2**	**22.6**
Aldi-Kyburz complex, 2 to 30 percent slopes		0.5		
Aldi-Kyburz-Rock outcrop complex, 30 to 75 percent slopes	1.0	1.0		
Barshaad-Fugawee-Duckhill variant association		5.1		0.8
Burnborough-Ticino-Gabica association	0.4	0.4		0.4
Burnborough-Ticino-Softscrabble association			1.4	
Cassiro gravelly sandy loam, 2 to 4 percent slopes			0.1	
Cassiro gravelly sandy loam, 4 to 8 percent slopes	<0.1	<0.1	0.2	<0.1
Cassiro gravelly sandy loam, 8 to 15 percent slopes			0.2	
Franktown-Aldi-Rock outcrop complex, 2 to 30 percent slopes	0.4	0.9		
Franktown-Aldi-Rock outcrop complex, 30 to 50 percent slopes	0.2	0.2		
Fraval-Booford-Jumbo association	3.4	3.4		3.4
Haypress-Tanob-Rock outcrop complex, 15 to 50 percent slopes	0.2	1.5	2.5	4.1
Indiano gravelly loam, warm, 15 to 30 percent slopes			0.6	
Indiano-Koontz-Flex association	1.7	1.7	<0.1	1.7
Kyburz-Aldi complex, 2 to 30 percent slopes	1.9	2.6		
Kyburz-Aldi complex, 30 to 50 percent slopes	0.5	0.5		
Kyburz-Rock outcrop-Trojan complex, 2 to 30 percent slopes		0.9		
Macareeno-Blackwell-Carioca association	2.4	2.4		2.4
Northmore sandy loam, 8 to 15 percent slopes			<0.1	
Softscrabble-Gabica-Burnborough association		2.4	2.0	4.4
Toiyabe-Corbett-Haypress association	4.9	5.3		5.3
Grand Total	**28.1**	**52.7**	**61.5**	**66.2**

Source: Natural Resources Conservation Service Soil Survey Geographic (SSURGO) dataset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CALIFORNIA SUBSTATION
CALIFORNIA
NEVADA
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Stream Flow Regime
Ephemeral
Intermittent
Perennial
Transmission Line Alternatives
Mitchell
Peavine
Poeville
Peavine/Poeville
Public and Private Roads to be Widened Temporarily
Stream
USFS Boundary
NOTE: SOIL UNIT NAMES CAN BE FOUND ON FIGURE B-2 SOIL LEGEND IN THE PROJECT AREA
N
1 inch = 5,000 feet
5,000 2,500 0 5,000
Feet
DATE DRAWN 11/25/2013
SPECIALIST REPORT
WATER AND SOIL
BORDERTOWN TO CALIFORNIA
120 KV TRANSMISSION LINE PROJECT
FIGURE B-1
SOILS IN THE PROJECT AREA

Soil Types

MUSYM, MUNAME

- 1010:Gabica very gravelly sandy loam, 8 to 30 percent slopes
- 101:Aquinas sandy loam, 4 to 8 percent slopes
- 102:Aquinas sandy loam, 8 to 15 percent slopes
- 1040:Orr variant gravelly sandy loam
- 104′:Orr variant coarse sandy loam, thin surface
- 1050:Waspo clay, 15 to 30 percent slopes
- 105′:Waspo stony clay, 30 to 50 percent slopes
- 1052:Waspo-Rock outcrop complex, 30 to 50 percent slopes
- 1054:Waspo gravelly clay, 2 to 8 percent slopes
- 106:Aquinas sandy loam, 8 to 15 percent slopes, eroded
- 110:Jowec variant sandy loam, 4 to 8 percent slopes
- 111:Jowec variant-Greenbrae sandy loams, 4 to 15 percent slopes
- 1120:Apmat very stony coarse sand, 2 to 8 percent slopes
- 1141:Bedell loamy sand, 2 to 4 percent slopes
- 1142:Bedell loamy sand, 4 to 8 percent slopes
- 1143:Bedell loamy sand, 8 to 15 percent slopes
- 1160:Jowec silty clay loam
- 1161:Jowec sandy loam
- 1170:Wedertz sandy loam, 2 to 4 percent slopes
- 1181:Haypress-Tanob-Rock outcrop complex, 15 to 50 percent slopes
- 120:Doten silty clay, 0 to 2 percent slopes
- 121:Doten silty clay, 8 to 15 percent slopes
- 127′:Tristan-Barshaad-Arzo association
- 130:Greenbrae sandy loam, clayey substratum, 0 to 2 percent slopes
- 131:Greenbrae sandy loam, 0 to 2 percent slopes
- 132:Greenbrae sandy loam, 2 to 4 percent slopes
- 134:Greenbrae sandy loam, clayey substratum, 4 to 8 percent slopes
- 136:Greenbrae sandy loam, 4 to 8 percent slopes
- 1400:Softscrabble-Gabica-Burnborough association
- 140:Hayboume loamy sand, 2 to 4 percent slopes
- 1410:Burnborough-Ticino-Gabica association
- 1411:Burnborough-Ticino-Softscrabble association
- 141:Hayboume loamy sand, 4 to 8 percent slopes
- 1420:Barshaad-Fugawee-Duckhill variant association
- 1430:Fraval-Booford-Jumbo association
- 143′:Fraval-Hirschdale-Duckhill variant association
- 1432:Fraval-Hirschdale-Jumbo association
- 1480:Macareeno-Blackwell-Carioca association
- 154′:MCQUARRIE-DUCO-TRISTAN ASSOCIATION
- 154′:McQuarrie-Duco-Tristan association
- 160:Incy sand, 4 to 8 percent slopes
- 1610:Water
- 171:Indian Creek gravelly sandy loam, 0 to 4 percent slopes
- 172:Indian Creek sandy loam, 4 to 8 percent slopes
- 173:Indian Creek sandy loam, 8 to 15 percent slopes
- 190:Manogue cobbly clay, 2 to 8 percent slopes
- 191:Manogue cobbly clay, 8 to 15 percent slopes
- 192:Manogue cobbly clay, 15 to 30 percent slopes
- 200:Northmore sandy loam, 0 to 2 percent slopes
- 201:Northmore sandy loam, 2 to 4 percent slopes
- 202:NORTHMORE SANDY LOAM, 4 TO 8 PERCENT SLOPES
- 202:Northmore sandy loam, 4 to 8 percent slopes
- 203:NORTHMORE SANDY LOAM, 8 TO 15 PERCENT SLOPES
- 203:Northmore sandy loam, 8 to 15 percent slopes
- 221:Oppio cobbly sandy loam, 8 to 15 percent slopes
- 222:Oppio cobbly sandy loam, 15 to 30 percent slopes
- 230:Cradlebaugh loam
- 240:Updike loam
- 250:Cassiro gravelly sandy loam, 2 to 4 percent slopes
- 251:Cassiro gravelly sandy loam, 4 to 8 percent slopes
- 252:Cassiro gravelly sandy loam, 8 to 15 percent slopes
- 260:Acrelane-Rock outcrop complex, 15 to 50 percent slopes
- 262:Acrelane very stony sandy loam, 8 to 15 percent slopes
- 280:Wedekind gravelly loam, 8 to 15 percent slopes
- 281:Wedekind gravelly loam, 15 to 30 percent slopes
- 282:Wedekind gravelly sandy loam, 30 to 50 percent slopes
- 300:Surgem stony sandy loam, 8 to 15 percent slopes
- 301:Surgem-Rock outcrop complex, 15 to 30 percent slopes
- 310:Risley-Rock outcrop complex, 8 to 15 percent slopes
- 311:Risley-Rock outcrop complex, 15 to 30 percent slopes
- 312:Risley cobbly loam, 15 to 30 percent slopes
- 350:Mizel very gravelly coarse sandy loam, 15 to 50 percent slopes
- 360:Pits
- 370:Lemm very gravelly coarse sandy loam, 4 to 8 percent slopes
- 420:Godecke loamy sand
- 452:Voltaire loam, strongly saline
- 480:Holbrook gravelly loamy sand, 2 to 8 percent slopes
- 482:Holbrook cobbly loamy sand, 2 to 8 percent slopes
- 496:Graufels-Glenbrook-Haypress association
- 500:Mottsville sand, 0 to 4 percent slopes
- 504:Mottsville sand, 8 to 15 percent slopes
- 505:Mottsville gravelly coarse sand, 4 to 8 percent slopes
- 510:Settlemeyer fine sandy loam, 0 to 2 percent slopes
- 514:Settlemeyer gravelly loam, 2 to 4 percent slopes
- 520:Dressler loamy sand, 2 to 4 percent slopes
- 550:Leviathan stony sandy loam, 0 to 2 percent slopes
- 551:Leviathan stony sandy loam, 2 to 8 percent slopes
- 553:Leviathan stony sandy loam, 15 to 30 percent slopes
- 554:Leviathan very stony sandy loam, 2 to 8 percent slopes
- 557:Leviathan very stony sandy loam, 30 to 50 percent slopes
- 585:Barnard-Trosi association
- 590:Springmeyer stony loam, 0 to 2 percent slopes
- 591:Springmeyer stony loam, 2 to 4 percent slopes
- 595:Springmeyer sandy clay loam, 0 to 2 percent slopes
- 600:Idlewild clay loam, drained
- 612:Verdico very stony sandy loam, 4 to 8 percent slopes
- 613:Verdico extremely stony sandy loam, 8 to 15 percent slopes
- 614:Verdico extremely stony sandy loam, 15 to 30 percent slopes
- 615:Verdico sandy loam, 4 to 8 percent slopes
- 620:Orr stony sandy loam, 2 to 4 percent slopes
- 621:Orr stony sandy loam, 4 to 8 percent slopes
- 622:Orr stony sandy loam, gravelly substratum, 2 to 4 percent slopes
- 623:Orr sandy loam, 0 to 2 percent slopes
- 640:Notus stony loamy fine sand
- 650:Chalco very stony clay loam, 15 to 30 percent slopes
- 651:Chalco very stony clay loam, 30 to 50 percent slopes
- 652:Chalco stony loam, 4 to 8 percent slopes
- 653:Chalco cobbly sandy loam, 8 to 15 percent slopes
- 660:Oest very bouldery sandy loam, 2 to 8 percent slopes
- 661:Oest bouldery sandy loam, 2 to 8 percent slopes
- 662:Oest extremely stony sandy loam, 2 to 8 percent slopes
- 663:Oest very gravelly loam, 15 to 30 percent slopes
- 664:Oest very gravelly loam, 8 to 15 percent slopes
- 668:Oest very bouldery sandy loam, 30 to 50 percent slopes
- 669:Oest gravelly sandy loam, 0 to 2 percent slopes
- 670:Galeppi sandy loam, 4 to 8 percent slopes
- 671:Galeppi sandy loam, 8 to 15 percent slopes
- 673:Galeppi sandy loam, 15 to 30 percent slopes
- 681:Reno very stony fine sandy loam, 8 to 15 percent slopes
- 683:Reno stony sandy loam, 2 to 8 percent slopes
- 730:Stodick very stony loam, 15 to 30 percent slopes
- 731:Stodick stony loam, 30 to 50 percent slopes
- 756:Toiyabe-Corbett-Haypress association
- 772:Booford very stony sandy loam, 8 to 15 percent slopes
- 775:Booford very stony loam, 30 to 50 percent slopes
- 780:Bieber stony sandy loam, 0 to 4 percent slopes
- 782:Bieber stony sandy loam, 8 to 15 percent slopes
- 800:Truckee silt loam
- 831:Fettic loam
- 861:Reywat extremely stony loam, 15 to 30 percent slopes
- 863:Reywat-Rock outcrop complex, 15 to 50 percent slopes
- 871:Xman very stony loam, 15 to 30 percent slopes
- 872:Xman very stony sandy loam, 8 to 15 percent slopes
- 873:Xman-Rock outcrop complex, 30 to 50 percent slopes
- 880:Zephan-Rock outcrop-Smallcone complex, 15 to 50 percent slopes
- 882:Zephan stony sandy loam, 15 to 30 percent slopes
- 890:Indiano gravelly loam, warm, 15 to 30 percent slopes
- 891:Indiano gravelly loam, warm, 30 to 50 percent slopes
- 892:Indiano-Koontz-Flex association
- 900:Flex very gravelly sandy loam, 15 to 30 percent slopes
- 901:Flex very gravelly sandy loam, 30 to 50 percent slopes
- 930:Old Camp stony sandy loam, 15 to 30 percent slopes
- 931:Old Camp-Rock outcrop complex, 15 to 50 percent slopes
- 932:Old Camp stony sandy loam, 8 to 15 percent slopes
- 962:Kayo very stony sandy loam, 4 to 8 percent slopes
- 971:Aladshi sandy loam, 2 to 4 percent slopes
- 974:Aladshi gravelly sandy loam, 4 to 8 percent slopes
- 980:Koontz gravelly loam, 8 to 15 percent slopes
- 982:Koontz stony loam, 15 to 30 percent slopes
- 991:Xeric Torriorthents-Urban land complex
- 992:Playas
- 994:Badland-Chalco-Verdico complex, 8 to 30 percent slopes
- ACF:Ahart-Waca, rhyolitic substratum complex, 30 to 50 percent slopes
- AQB:Aquolls and Borolls, 0 to 5 percent slopes
- ARE:Aldi-Kyburz complex, 2 to 30 percent slopes
- BCE:Bucking-Bucking variant complex, 2 to 30 percent slopes
- BCG:Bucking-Bucking variant complex, 30 to 75 percent slopes
- BDE:Bucking-Bucking variant-Cryumbrepts, wet complex, 2 to 30 percent slopes
- BDF:Bucking-Bucking variant-Cryumbrepts, wet complex, 30 to 50 percent slopes
- BME:Badenaugh-Martineck-Dotta association, 2 to 30 percent slopes
- BaE:BADENAUGH VERY COBBLY SANDY LOAM, 2 TO 30 PERCENT SLOPES
- BaEsv:Badenaugh very cobbly sandy loam, 2 to 30 percent slopes
- BcA:BALMAN LOAM, 0 TO 2 PERCENT SLOPES
- BeG:BASIC ROCK LAND
- BrA:BIDWELL SANDY LOAM, 0 TO 2 PERCENT SLOPES
- BtA:BIDWELL LOAM, 0 TO 2 PERCENT SLOPES
- CRE:Aldi variant-Kyburz-Jorge variant complex, 2 to 30 percent slopes
- CRF:Aldi variant-Kyburz-Jorge variant complex, 30 to 50 percent slopes
- DfC:DOTTA SANDY LOAM, 2 TO 9 PERCENT SLOPES
- DgE:DOTTA GRAVELLY SANDY LOAM, 9 TO 30 PERCENT SLOPES
- FME:Fugawee sandy loam, 2 to 30 percent slopes
- FMF:Fugawee sandy loam, 30 to 50 percent slopes
- FTE:Fugawee-Tahoma complex, 2 to 30 percent slopes
- FTF:Fugawee-Tahoma complex, 30 to 50 percent slopes
- FUE5:Kyburz-Trojan complex, 2 to 30 percent slopes, altered
- FUE:Kyburz-Trojan complex, 9 to 30 percent slopes
- FUF:Kyburz-Trojan complex, 30 to 50 percent slopes
- FVE:Fugawee-Tahoma-Aquolls complex, 2 to 30 percent slopes
- GaB:GALEPPI LOAMY COARSE SAND, 2 TO 5 PERCENT SLOPES
- GaE:GALEPPI LOAMY COARSE SAND, 5 TO 30 PERCENT SLOPES
- GdE:GALEPPI COBBLY LOAMY COARSE SAND, 5 TO 30 PERCENT SLOPES
- GpF:GLEAN EXTREMELY STONY SANDY LOAM, 9 TO 50 PERCENT SLOPES
- GpFsv:Glean extremely stony sandy loam, 9 to 50 percent slopes
- HAE:Haypress-Toiyabe complex, 2 to 30 percent slopes
- HAG2:Haypress-Toiyabe-Rock outcrop complex, 30 to 75 percent slopes
- HAG:Haypress-Toiyabe complex, 30 to 75 percent slopes
- HBE:Haypress-Toiyabe-Cryumbrepts, wet complex, 2 to 30 percent slopes
- HBG:Haypress-Toiyabe-Cryumbrepts, wet complex, 30 to 75 percent slop es
- JSE:Jorge-Cryumbrepts, wet-Tahoma complex, 2 to 30 percent slopes
- JSG:Jorge-Cryumbrepts, wet complex, 30 to 75 percent slopes
- JTE:Jorge-Tahoma complex, 2 to 30 percent slopes
- JTF:Jorge very stony sandy loam, 30 to 50 percent slopes
- JUE:Jorge-Rubble land complex, 2 to 30 percent slopes
- JUG:Jorge-Rubble land complex, 30 to 75 percent slopes
- JcA:JAMES CANYON SILT LOAM, 0 TO 2 PERCENT SLOPES
- KME5:Kyburz-Aldi complex, 2 to 30 percent slopes, altered
- KME:Kyburz-Aldi complex, 2 to 30 percent slopes
- KMF:Kyburz-Aldi complex, 30 to 50 percent slopes
- KPC:Aldi-Aquolls-Kyburz complex, 2 to 9 percent slopes
- KRE:Kyburz-Rock outcrop-Trojan complex, 2 to 30 percent slopes
- KRF2:Kyburz-Rock outcrop-Trojan complex, 30 to 50 percent slopes, ero ded
- KRF:Kyburz-Rock outcrop-Trojan complex, 30 to 50 percent slopes
- KRG:Aldi-Kyburz-Rock outcrop complex, 30 to 75 percent slopes
- KVE:Kyburz-Trojan-Aquolls complex, 2 to 30 percent slopes
- Lo:LOYALTON FINE SANDY LOAM
- MIG:Meiss-Rock outcrop complex, 30 to 75 percent slopes
- MOE:Franktown-Aldi-Rock outcrop complex, 2 to 30 percent slopes
- MOG:Franktown-Aldi-Rock outcrop complex, 30 to 50 percent slopes
- MRG:Fugawee variant-Fugawee-Rock outcrop complex, 30 to 75 percent s lopes
- NaE:NEWLANDS-ROCK OUTCROP COMPLEX, 2 TO 30 PERCENT SLOPES
- PX:Pits, borrow
- R:Riverwash
- RAG:Rock outcrop-Franktown-Kyburz complex, 50 to 75 percent slopes
- Ra:RAMELLI CLAY
- ReE:REBA SANDY LOAM, 2 TO 30 PERCENT SLOPES
- Rw:RIVERWASH
- Rwsv:Riverwash
- SUG:Rubble land-Rock outcrop complex
- Sw:SMITHNECK SANDY LOAM
- TPG3:Toiyabe-Rock outcrop-Haypress complex, 30 to 75 percent slopes, severely erodec
- TUE:Trojan-Sattley-Cryumbrepts, wet complex, 2 to 30 percent slopes
- TWE:Rouen variant-Aspen variant-Sierraville complex, 2 to 30 percent slopes
- TWF6:Rouen variant-Aspen variant-Sierraville complex, 20 to 50 percen t slopes
- TWF:Rouen variant-Aspen variant-Sierraville complex, 30 to 50 percen t slopes
- TXE:Rouen variant-Cryumbrepts, wet-Aspen variant complex, 2 to 30 pp ercent slopes
- TrE:TROJAN STONY SANDY LOAM, 2 TO 30 PERCENT SLOPES
- TrF:TROJAN STONY SANDY LOAM, 30 TO 50 PERCENT SLOPES
- TrFsv:Trojan stony sandy loam, 30 to 50 percent slopes
- TsD:TROSI VERY STONY SANDY LOAM, 2 TO 15 PERCENT SLOPES
- TsDsv:Trosi very stony sandy loam, 2 to 15 percent slopes
- TtD:TROSI EXTREMELY STONY SANDY LOAM, 2 TO 15 PERCENT SLOPES
- TtDsv:Trosi extremely stony sandy loam, 2 to 15 percent slopes
- TuF2:TROSI-SARALEGUI COMPLEX, 15 TO 50 PERCENT SLOPES, ERODED
- TuF2sv:Trosi-Saralegui complex, 15 to 50 percent slopes, eroded
- W:AREAS UNDER WATER IN PONDS AND RESERVOIRS
- W:Water
- XCF:Kyburz-Aldi variant-Jorge variant complex, 30 to 50 percent slop es

SPECIALIST REPORT
WATER AND SOIL

BORDERTOWN TO CALIFORNIA
120 KV TRANSMISSION LINE PROJECT

FIGURE B2
SOILS LEGEND IN THE PROJECT AREA

APPENDIX C

Stream Photographs

Location 3, Unnamed Creek
Crossed by Mitchell and Peavine Alternatives

Location 4, Unnamed Channel
Crossed by Mitchell and Peavine Alternatives

Location 5, Unnamed Channel
Crossed by Mitchell and Peavine Alternatives

Location 7, Wetland near Ephemeral Stream
Crossed by Mitchell Alternative

Location 14, South Branch Dog Creek
Crossed by Mitchell and Peavine Alternatives

Location 15, Sunrise Creek
Crossed by Poeville and Peavine/Poeville Alternatives

Location 17, Jones Creek upstream of A5
Crossed by Poeville Alternative

Location 19, Unnamed Channel
Crossed by Poeville Alternative

Location 20, Unnamed Channel
Crossed by Poeville Alternative

Location 21, Unnamed Channel
Crossed by Poeville Alternative

Location 21, Unnamed Channel
Crossed by Poeville Alternative

Location 22, Unnamed Channel
Crossed by Poeville Alternative

Location 23, Ditch
Crossed by Poeville Alternative

Location 24, Unnamed Channel
Crossed by Poeville Alternative

Location 25, Unnamed Channel
Crossed by Poeville Alternative

Location 26, Unnamed Channel (with odd orange water)
Crossed by Poeville Alternative

Location 27, Unnamed Channel
Crossed by Poeville Alternative

Location 28, Brooklyn Creek
Crossed by Poeville Alternative

near Location 28, small seep
Crossed by Poeville Alternative

Location 29, unnamed channel
Crossed by Poeville Alternative

near Location 30, small seep next to ephemeral channel
Crossed by Poeville Alternative

Location 34, Bull Ranch Creek
Crossed by Poeville and Peavine/Poeville Alternatives

Location 35,Truckee River (East Crossing)
Crossed by Poeville and Peavine Poeville Alternatives

Location 36, Truckee River (West Crossing)
Crossed by Poeville and Peavine/Poeville Alternatives

Location 38, Bull Ranch Creek (upstream of Location 34)

Location 39, intermittent channel
Crossed by Peavine/Poeville Alternative

Location 40, wetland associated with private reservoir
Crossed by Poeville and Peavine/Poeville Alternatives

(between Locations 3 and 4) Hill Lane Ditch?
Crossed by Poeville and Peavine/Poeville Alternatives

Location 40, wetland associated with private reservoir
Crossed by Poeville and Peavine/Poeville Alternatives